The RUBBER AGE

Table of Contents

Vol. 24 FEBRUARY 10, 1929 No. 9

FEATURES AND NEWS DEPARTMENTS

Latest News of the Rubber Industry 485
Some New Laboratory Work on Rubber 490
Tires Around the World 495
The Soviet Rubber Industry 497
Goodyear Starts Planting in the Philippines 499
Schaphorst's Chats With the Engineer 501
Editorial Comment 503
Short News Items 505
Items About Well-Known Rubber Men 507
Rubber News Around the World 508
Rubber Goods and Specialties 509
Crude Rubber Items 510

MARKETS AND STATISTICS

Statistical Section 521
Cotton and Fabrics 514
Crude, Scrap and Reclaimed Rubber 514
Chemicals and Compounding Materials 516

MARKET PLACE 517
ADVERTISING INDEX 525

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Editorial Comment 503
Short News Items 505
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Rubber Goods and Specialties 509
Crude Rubber Items 510

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Late News of the Rubber Industry

Tire Price Reductions Announced by Companies

THE B. F. Goodrich Company has announced a readjustment of dealer prices on tires, the new schedule taking effect February 4. Officials of the company, however, declare that no general price move has been made and that the new dealer price list carries increases up to 2½% as well as reductions from 2½% to 10%.

Representatives of the Goodyear Tire & Rubber Company state that, although no definite action has been taken, the matter of dealer price revision, as announced by other companies, has been considered and the Goodyear organization will meet any changes.

The tire price reductions made by Goodrich and at least one other leading manufacturer proved unexpected and unwelcome news to the bullish element on the crude rubber market during the first few days of February, and the upward movement was given a decided setback on that account. Announcements that the action of the manufacturers was more of a competitive readjustment of price schedules than a direct move toward a price cut brought trifling rallies, but failed to reassure operators sufficiently to regain the losses in late quotations.

Goodrich Net is $3,500,000 After Heavy Inventory Loss

THE directors of the B. F. Goodrich Company after their regular quarterly meeting held on January 23, announced a net profit of approximately $3,500,000 for the year ended December 31, 1928, after federal taxes, depreciation of properties, interest charges, etc. This is equivalent after dividend requirements on the 7 per cent preferred stock to $1.48 a share on the 745,910 shares of no-par common stock. The net income for the last six months of the year was slightly in excess of $5,000,000, but this was cut down by the loss for the first half of 1928 occasioned by the sharp reductions in the inventory value of crude rubber on hand or contracted for.

The directors reported that consolidated net sales of the company for the fiscal year totaled approximately $148,250,000 as compared with the figure of $151,684,960 for the preceding year. The net profit of $3,500,000 compares with $11,780,306 in 1927, equivalent after 7 per cent preferred dividends and after setting aside $1,000,000 as a reserve for contingencies to $15.44 a share on 602,216 common shares then outstanding.

A regular quarterly dividend of $1 on the common stock was declared, payable March 1 to stockholders of record as of February 8. Two regular dividends of $1.75 each were declared on the preferred stock, payable April 1 and July 1 to stock of record March 8 and June 10 respectively. The directors also approved the retirement of the 11,880 shares of preferred stock in accordance with the provision of the charter of the company. The regular audit of the company's accounts is now in progress and, when completed, the annual report will be published in the usual manner with exact and detailed figures.

Prospects for Goodrich in 1929, however, are generally reported to be excellent in line with those of other well managed rubber companies. Inventory losses should be negligible at the worst and in all probability will be entirely eliminated, while Goodrich will doubtless get its full share of the original equipment business on the record production of automobiles and trucks that is expected.

As of June 30 last, current assets amounted to $73,593,741 against current liabilities of $17,966,121, a ratio of better than 4 to 1. Working capital amounted to $55,627,620, compared with $53,603,318 on June 30, 1927, $61,105,344 on June 30, 1926, and $44,004,062 on June 30, 1925. Cash and Liberty bonds alone totaled $8,705,151, equal to almost 50 per cent of current liabilities. Surplus stood at the highest figure ever attained, $35,649,046, as against $25,604,036 on June 30, 1927, and $24,003,437 on June 30, 1926. The price of the company's common stock has risen from below 70 to above 100 on the New York Stock Exchange since last June.

Firestone Denies Rumors of New Southern Factory

WHILE admitting that he had recently taken a trip through central Florida and a number of the coastal cities to study the industrial possibilities of the south as well as to see for himself how his company's products are being distributed, Harvey S. Firestone, president of the Firestone Tire & Rubber Company, has denied the current rumor that his organization will establish a branch factory in one of the southern states.

Asked the question by a newspaper reporter last month, Mr. Firestone declared, "We will not establish a branch in the south unless we have to do so to protect our business. We have no immediate plans for locating in the south." He added, "Greater industrial development in the south is certain. In the next few years, there will be a great deal more manufacturing there than at present."

Mr. Firestone is returning to Florida to remain until April and will visit both Henry Ford and Thomas A. Edison while there. He is watching with interest the experiments being made by Mr. Edison at his Ft. Myers laboratory in an attempt to grow rubber in the United States.

Fisk Tire President Sees Concentration of Industry

THAT present conditions are basically sound in the tire industry, which consumes approximately 85 per cent of the crude rubber imported into the United States, is the opinion of H. T. Dunn, president of the Fisk Tire Company, Chicopee Falls, Mass. This year may be expected to bring reasonable profits to the manufacturers and dealers, he asserts in a recent statement, and very low tire prices to the motorists.

H. T. DUNN

"Every investor and automobile owner who has followed the financial pages," says Mr. Dunn, "knows that the English planters, by limiting production under the Stevenson plan, forced up the price of rubber and kept it up for several years until the recent removal of restrictive measures. As a result, crude rubber is now selling in the neighborhood of 20 cents a pound, half the average price of 1927, and a quarter the average price of 1925.

"Buying their rubber on a falling market, American tire manufacturers for the past few years have had to operate under extremely difficult conditions. Now, however, with prices stabilized, the manufacturers have used up their inventories of high-priced crude, and the signs are auspicious for a prosperous year.

"As an industry, the tire manufacturers of America build better tires than those of any other nation. Quantity production and mass selling are giving the tire makers of this country a long lead, competitively speaking, over the rest of the world. Never, since automobiles were invented, has the motorist been able to buy such good tires at such low prices as prevail today.

"Similar to the development in the automotive industry, leadership in tire manufacturing is being concentrated among a few big production companies. These concerns, numbering less than a dozen, will supply the 20,000,000 tires which will be needed for new cars during the coming year. Possessing the advantages that go with supplying original equipment, these leaders are setting a swifter and swifter pace through their ability to utilize quantity production facilities to the utmost.

"The Fisk Tire Company expects, and is prepared for, the biggest and most prosperous year that it has ever enjoyed. It has obtained a number of original equipment contracts from leading motor car manufacturers that will call for several million tires, and is planning on a 60 per cent increase over last year on tires to be sold for replacement through its nationwide retail dealer organizations. To handle this large volume of business, the company has recently expended $2,000,000 for improvements in plant and equipment."

India Has Profit of $65,000; Considers Los Angeles Plant

NET operating profit for the year 1928 that will be shown on the books of the India Tire & Rubber Company, Akron, O., will total exactly $65,000, according to a statement issued by directors of the company after a conference on January 23. Against this operating profit, total charges of $313,000 were made to cover the adjustment of inventories to realizable values and other charge-offs.

This left a surplus deficit as of the end of the year of $387,000, according to the official statement of the board of directors. The balance sheet as of the close of the year shows total current assets of $1,905,000 to pay current liabilities of $942,000. Depreciated values of lands, buildings and equipment were figured at $1,005,000 and other miscellaneous assets at $98,000, showing total assets of $3,008,000.

The possibility that the India Tire & Rubber Company will erect a tire factory at Los Angeles was disclosed last month, when Frank L. Ryan, vice-president and sales manager of the company, revealed while on a visit to that city that he intends to make a report to his firm on California conditions and that other officials of the organization may also go west to study plans for such a plant. Mr. Ryan signed a contract with the firm of Nelson & Price, Inc., said to be the world's largest tire dealers, for the exclusive dealership of India tires for Los Angeles and vicinity. The new contract, declared to be the largest individual tire transaction ever signed, calls for a minimum of $5,500,000 worth of India tires over a period of three years.

More Leaders in Industry See 1929 as a Record Year

EXECUTIVES of the leading tire and rubber companies in Akron and other centres are practically unanimous in their belief that the industry will experience another record breaking year, especially as regards production and demand for tires. The first six months is almost certain to witness a total output in excess of anything experienced during the first half of former years, it is stated, based on contracts for delivery already in hand from dealers and motor companies for original equipment.

Paul W. Litchfield, president of the Goodyear Tire & Rubber Company, says he would not be surprised if the 1928 business balance is reversed this year, the profitable half coming in the first instead of the last six months. Mr. Litchfield estimates that Goodyear will manufacture 20,000 more tires daily this year than last, the increase to be handled principally by the new California and Alabama plants. The company's total output is approximately 76,000 tires a day.

President Harvey S. Firestone of the Firestone Tire & Rubber Company predicts that 20,000,000 tires will be produced and sold by his companies this year. The Firestone plants in California and England are expected to contribute considerably toward this total.

James D. Tew, president of the B. F. Goodrich Company, is likewise optimistic. Goodrich, it has been announced, plans further expansion of its Akron plant, which was enlarged last year to meet increased production demands. The company makes 33,000 tires at Akron daily in addition to mechanical goods and rubber boots and shoes.

"We have every reason to believe that 1929 will prove a very satisfactory year for the rubber industry," Mr. Tew declared at Akron last month. "Every indication points to a greater demand for tires and other types of rubber goods; and, with the elimination of the Stevenson Act, the serious fluctuations which have heretofore occurred in crude rubber prices, should be eliminated. This will not only be a great help as a stabilizing measure, but also will lend confidence to the manufacturer of rubber goods as well as to the investing public."

John W. Mapel, president of the Goodyear Tire & Rub-

ber Company of California, bases his predictions on optimistic forecasts made by the leading statistical organizations throughout the country. "General business conditions will continue at the same prosperous level maintained during 1928 and it is expected that the tire business will be especially healthy. At Los Angeles Goodyear's plant has increased production for 1929 from the present mark of 10,000 tires a day to a new daily production mark of 12,500 tires, which will be insured by facilities now being installed."

Parts and Accessory Manufacturers Had Their Greatest Year in 1928

THE past year was the greatest twelve-month period on record for suppliers of original equipment to car and truck manufacturers and of replacement parts to the trade, according to the Motor and Equipment Association, which is composed of approximately 800 manufacturers and wholesalers of automotive parts and equipment. Averages of their monthly business last year, similar to the average of business for motor vehicle manufacturers, was well ahead of 1927 and also of 1926, the previous record year. December business for all groups was better than for December, 1927.

Accessory and garage equipment makers had a satisfactory year, but closed 1928 with a business volume average somewhat below the two preceding years. Garage repair equipment makers had an unusually prosperous year in 1927.

Aggressive work in sales development, credit interchange and cooperation with other organizations in promotion of motor transportation and the automotive trade was planned for 1929 by committees and officers of the Motor and Equipment Association, who conferred during the week of the National Automobile Show at New York. The executive committee, of which E. R. Seager, of the Pennsylvania Rubber & Supply Company, is a member, held a meeting, and another session was that of the sales development committee, in which Charles G. Gates of the Gates Rubber Company played an active part. Other committees which met during the week were the membership committee, of which F. R. Lee of the Thermoid Rubber Company is a member, and the safety in traffic committee in which C. C. Gates of the Gates Rubber Company is active.

Mason Bondholders Purchase Tire Plants for $600,000

THE Mason Tire & Rubber Company with plants at Kent and Bedford, O., was sold under the auctioneer's hammer on January 14 for $600,000 to the bondholders' protective committee, represented by F. M. Brooke of Philadelphia. The stock on hand and inventories were sold for $119,500 to the General Parts Corporation, Flint, Mich., and Winternitz & Company, Chicago, Ill.

As soon as the new organization is perfected, activity at the Mason plant at Kent will be resumed, and it is expected that plant operations will be under way by March 1 at the latest. The new company is said to be in an excellent position to begin production immediately, because the nucleus of the organization has been kept intact. Most of the department heads have been kept on the payroll, being paid by either the receiver or the bondholders.

The sale of the property, including the Kent and Bedford factories, apartment houses at Kent, land, machinery, patents, trade marks, goodwill and everything but inventories, was made at the full appraised price. The Bedford plant was valued at $80,000 and the Kent factory at $520,000, making a total appraised value of exactly $600,000, the figure bid by the bondholders. The stock and inventories, however, had been appraised at $170,000. In the bidding for the plants, there were two other bidders besides the bondholders' committee, a Chicago and a New York concern whose interests were salvaging the two properties.

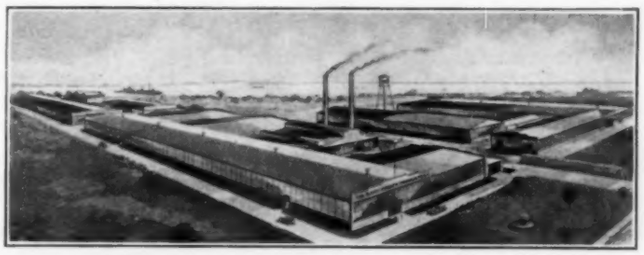
Albert Caris of Ravenna, O., has been receiver of the company since January 1 and was in charge of the sale, assisted by H. R. Loomis, his law partner. When the Mason organization went into receivership, P. W. Eigner, president of the Kent National Bank, was appointed receiver and served until December 31. The bond indebtedness of the company is estimated at $1,900,000.

Barr Rubber Products Company Operating in New Factory

PRODUCTION with a full force of nearly 200 workers was started on January 28 in the new plants of the Barr Rubber Products Company at Sandusky, O., manufacturers of toy balloons and other rubber novelties. The company had been shut down since September 6 when its former factory building was destroyed by fire, but it is now operating in what was previously the plant of the Dauch Tractor Company.

It was originally scheduled to start actual production in the new buildings on January 21, but the failure of two mills and other equipment to arrive on time prevented an earlier resumption of operations. "The outlook for rubber products is very good now," said Nelt Barr, president of the company, in a recent statement. "The company has already sold most of the products that will be manufactured between now and early spring."

Several new buildings have been erected at the former tractor plant, including structures to house a mixing room and a dipping room. These are in separate buildings about 20 feet from the main plant in order to minimize fire hazards. Other new structures provide room for the making of forms and other processes. Three 12,000-gallon capacity tanks in which to store naphtha have also been set up apart from the main buildings.



The New Barr Rubber Factory

The entire plant has been so arranged that the product will move in a steady line from the raw rubber through the dipping, forming, curing, rolling, drying, removing and other processes to the shipping room without any lost motion. With the additions made the plant now extends 480 feet in length.

At the time of the fire, the Barr Company was ranked as the third largest of its kind in the world. The original capitalization of the firm was $25,000 in 1920, but this has steadily increased as the production and sales volume have grown. It is understood that the taking over of the new plant facilities involved the issuance of new stock, of which shares to the amount of $50,000 were taken by the Dauch estate and $75,000 by business men and citizens of Sandusky.

"It is fair to assume," Mr. Barr stated when negotia-

tions for the factory were first approved, "that with the new plant facilities which are to be provided, with new and improved equipment, and with more ample working capital, the corporation will be able to expand its business in 1929 to $500,000."

Pirelli Company of Italy Sells Stock in America

THE Pirelli Company of Italy, largest rubber manufacturer in that country and one of the largest in Europe, has issued 50,000 American shares of common stock to be sold in the United States by the National City Company at $60 a share. According to the statement issued with the announcement of the issue, this $3,000,000 offering does not represent any additional corporate financing. Temporary certificates for these American shares have been admitted to listing on the New York Stock Exchange on a "when issued" basis.

The Societa Italiana Pirelli, in addition to its plants and business in Italy, founded more than 57 years ago, controls the Pirelli International Company, which owns subsidiary companies selling and manufacturing Pirelli products outside Italy, and also a rubber producing company in Java. The Pirelli Company of Italy has assured itself supplies of raw material through its stock-ownership of two companies operating important cotton spinning and weaving mills.

The Pirelli group is a completely integrated organization for the manufacture and sale of cables and wire for power, telephone, telegraph and submarine cable transmission ranking as one of the world's largest producers of such articles. The company is also a large producer of a wide variety of other rubber articles including automobile and other tires and floor covering. The principal plant at Bicoca comprises 35 modern, fireproof, reinforced concrete buildings, having an aggregate floor area of 2,400,000 square feet.

The property, plant and equipment was valued at $13,360,253, as of December 31, 1927, and the company's investment in the Pirelli International Company is carried in the balance sheet at $450,098. According to a statement of Dr. Alberto Pirelli, managing director, the consolidated pro forma balance sheet, as of December 31, 1927, set up in accordance with American accounting practice, indicates a book value of about $71 a share without taking into account certain undisclosed asset values. Net earnings available for dividends averaged $1,186,772 annually for the five years from 1922 to 1926 and amounted to $1,087,823 for 1927. Profits for 1928 are expected to show a satisfactory increase, and it is expected that a dividend equal to approximately $2.89 per American share will be paid in April of this year for the fiscal year ending December 31, 1928.

Hinshaw Elected Chairman of Akron Rubber Group

AT THE meeting of the Akron Rubber Group of the American Chemical Society, held January 28 in the Goodyear Theatre, G. K. Hinshaw of the development department of the Goodyear Tire & Rubber Company was elected chairman for the present year. He succeeds Dr. H. A. Winkelmann of the Philadelphia Rubber Works in this position.

K. D. Smith of the B. F. Goodrich Company was chosen vice-chairman at the meeting, taking the place formerly filled by W. H. Fleming of the Goodyear Tire & Rubber Company. C. W. Sanderson, also of the Goodyear organization, was selected to act as secretary and treasurer, succeeding to the post held by R. J. Bonstein of the Seiberling Rubber Company.

More than 500 Akron technical men were present at the session and conducted an informal discussion on the general subject of the measurements of rubber thickness. Three papers were read, the topics being "Essentials for Accurate Gauging of Compressible Materials," by R. W. Brown, Firestone Tire & Rubber Company; "Some Practical Methods of Gauging Thickness at Calenders," by E. O. Dietrich, B. F. Goodrich Company; and "Some Causes of Variability of Gauge and Unit Weight of Calendered Products," by R. D. Evans, Goodyear Tire & Rubber Company.

The date of the next meeting to be conducted by members of the Akron Rubber Group will be announced in the near future.

General Tire & Rubber Plans California Plant

ACCORDING to statements given out by William F. O'Neil, president of the General Tire & Rubber Company, while on a visit to Los Angeles on January 24, his company is definitely making plans to erect a factory in that city in about a year. Increased business on the Pacific coast was given as one of the principal reasons for the decision.

Mr. O'Neil made his disclosure at the annual Pacific coast sales conference, for which he went to California together with Frank Gable, factory engineer, Ben Heer, assistant sales manager, and Dan A. Kimball, manager of the coast district. He made a comprehensive survey of facilities for the manufacture of tires in southern California and was particularly impressed with the number of trained rubber workers in Los Angeles as a result of the establishment of other tire plants in the vicinity.

"Los Angeles is the logical place for a tire factory," Mr. O'Neil was reported to have said. It was further stated that the proposed plant would employ about 2,000 workers, and would be practically equal in size to the company's Akron factory which has a capacity of approximately 15,000 tires and 20,000 tubes daily.

The General Tire & Rubber Company has steadily increased its production and sales volume since its establishment 14 years ago and is now selling tires and tubes to a total value of more than $26,000,000 annually. A $1,000,000 expansion of the company's Akron plant is now under way.

Rubber and Tire Men Present at Chicago Automobile Show

REPRESENTATIVES of most of the leading tire and rubber companies were present from January 26 to February 2 at the 29th annual Chicago National Automobile Show at the Coliseum in that city. There were no tire exhibits in accordance with the policy of the Rubber Association of America, but manufacturers of rubber accessories and related products had prominent displays.

The American Hard Rubber Company, New York City, showed its Husted hard rubber steering wheels in an attractive booth, and A. Schrader's Son, Inc., Brooklyn, N. Y., had a display of its tire valves, valve parts and tire gauges. The John Warren Watson Company, Philadelphia, Pa., used two exhibit booths for a showing of its new "rubber flow" Stabilator, and the Moto Meter Company, Long Island City, N. Y., displayed its line of tire pressure gauges and other accessories. The American

Automatic Devices Company, Chicago, Ill., exhibited rubber windshield wipers and rubber floor mats. There were also displays of tire vulcanizing and other shop equipment.

In addition to those with exhibit booths at the show, there were executives and sales representatives present during show week from several other companies, including the Firestone Tire & Rubber Company, Fisk Tire Company, B. F. Goodrich Company, Goodyear Tire & Rubber Company, E. I. du Pont de Nemours & Company, India Tire & Rubber Company, Indiana Rubber & Insulated Wire Company, Kelly-Springfield Tire Company, Miller Rubber Company, Packard Electric Company, Pennsylvania Rubber Company, Pharis Tire & Rubber Company, Pocono Rubber Cloth Company, Seiberling Rubber Company, and Swinehart Tire & Rubber Company, and United States Rubber Company.

Rubber Association of Canada Elects Carlisle as President

THE ninth annual meeting of the Rubber Association of Canada was held at the King Edward Hotel, Toronto, Can., on January 29. The meeting resulted in the election of the following officers for the ensuing year: C. H. Carlisle, president; W. A. Eden, vice-president; C. N. Candee, treasurer; C. A. Jones, assistant treasurer; A. B. Hannay, manager and secretary.

Mr. Carlisle, the present head of the Association, was the first to hold that honor, having been elected in 1920, upon the formation of the organization. He returns now as executive head, after serving actively in the interim on the board of directors.

The banquet in the evening following the annual meeting was attended by over three hundred Association members and guests, being presided over by E. W. BeSaw, the retiring president. Addresses were also made by Justice Riddell, J.A., LL.D., and F. A. Seiberling, president of the Rubber Association of America, who was introduced by C. H. Carlisle of the Goodyear Tire & Rubber Company and the new president of the Canadian Association.

In the course of Mr. Carlisle's address he said:

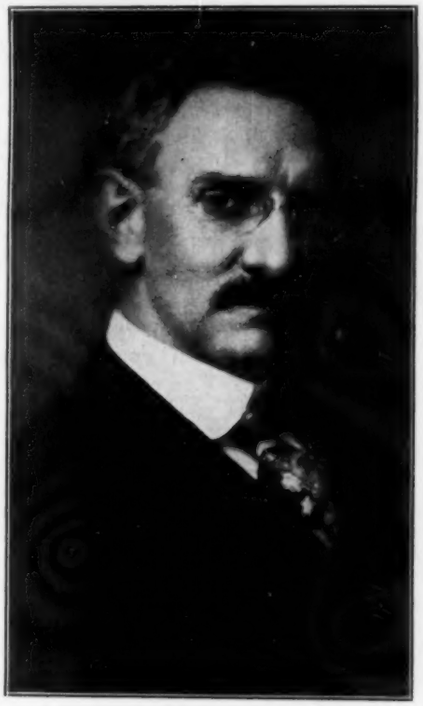
"The Association, composed of members from each rubber manufacturing enterprise, co-operates in the exchange of ideas for the benefit of the Canadian rubber industry and particularly for the consuming public, because each move in the manufacture of any article in the industry is made with the needs of the public foremost in the producer's mind. No manufacturer can continuously succeed unless that thought dominates his efforts.

"I would like to quote a few figures which will show clearly what the rubber industry means to Canada. I will use round numbers so that they can be easily remembered. Total assets in 1927 amounted to $80,000,000 as compared with $58,000,000 in 1920, or an increase of 37%. In 1927 there was 16,000 employees as compared with 11,000 in 1920, or an increase of 50%. In 1928 we used nearly 70,000,000 lbs. of rubber as compared with 22,000,000 lbs. in 1920. The total gross value of production in 1928 will approximate $100,000,000, including tires, footwear and all other rubber goods. Last year over 4,000,000 auto tires were made and over 21,000,000 pieces of footwear and in addition to these many other rubber articles such as belting, hose and drug sundries.

"As an example of what the rubber industry has accomplished in the manufacture of automobile tires as it affects the consumer, let me again quote you a few figures. In 1913 the average tire cost to the car owner was about 1c per mile. In 1917 it cost 3/5c per mile; 1922, 1/3c per mile and in 1927 less than 1/5c per mile. In other words, in 1927 a tire cost about 1/7 of the 1913 cost.

"The aim of our Association is to promote in the industry a mutual confidence and high standard of business ethics. We are striving to eliminate trade abuses and to promote sound and economic business customs, to foster wholesome competition and provide an opportunity to do business with adequate return and thus generally to render a better service to the public.

"At no time has the future of this great Dominion of Canada had a brighter outlook nor has its wealth and prosperity been more keenly recognized by other countries. We believe the Canadian rubber industry has played no small part in adding its 'bit' to the Dominion's present standing among the countries of the world and can be relied upon to continue its ever untiring efforts."



C. H. CARLISLE

In the annual report of the Association, the manager and secretary states, "Measured by importations of crude, 1928 was the greatest year in the history of rubber manufacturing in Canada. Government reports give the year's importation of crude as 69,197,385 pounds, which was ten million pounds or 17% greater than the crude importation of 1927, which year also was a record breaker. As practically no crude is re-exported from Canada, the import figures, which are official, give an exceedingly good yearly measure of the activity of Canadian rubber factories.

"Canadian tire production, last year, and tire shipments to car manufacturers, to tire dealers, were greater than ever before, but exports were slightly below 1927. Four and a third million casings were made, an increase of some three hundred and twenty-five thousand over 1927; a little more than a million were shipped to car manufacturers, this being a betterment of some 335,000 units; a million and a half were shipped to dealers, a 200,000 betterment; while 1,600,000 were exported, a decrease of some 30,000 casings compared with 1927 exportation.

"For those interested in the effect of a tariff on industry, there is a lesson in the circumstance that 1928 showed a small decline in Canadian tire exports. Two years ago England imposed a duty of 22½% against Canadian tires. Goodyear, Firestone, Goodrich and other North American companies at once began the erection of factories in England and these got into production late in 1927 or early in 1928. As a result Canada's exportation of casings to Great Britain declined in 1928 by 64% in dollars and by 66% in units.

"In Canada, the weather was unkind to the rubber footwear manufacturer during 1928. Absence of snow, slush, and extreme cold in the most populous portions of the Dominion so reduced purchases that there are today large inventories to be carried into next season.

"Taken altogether, the figures show that in 1928 almost nine and a half million pairs of a value of more than eight and a half million dollars were exported."

Some New Laboratory Work on Rubber

A Continuation of the Experimental Work Reported by Dr. Somerville During September and October of 1928 at Swampscott, Birmingham, London, Paris and Hamburg

By A. A. SOMERVILLE AND J. M. BALL

CRUDE rubber is not of much use commercially or industrially until after it has been put through a chemical process discovered by Charles Goodyear: that of adding sulphur and heating. But sulphur is not the only material that can be used to change and improve the natural physical properties of raw rubber. There are other things than sulphur that are beneficial, one of which is Selenium.

It is a pleasure to be permitted to talk here in Boston before a meeting of the Northeastern Section of the American Chemical Society and the Boston Rubber Group, devoted at this time particularly to the subject of rubber. It is a privilege to be permitted to talk on the subject of Selenium at this meeting because it is coming back very close to the home of Selenium so far as it is associated with the rubber industry.

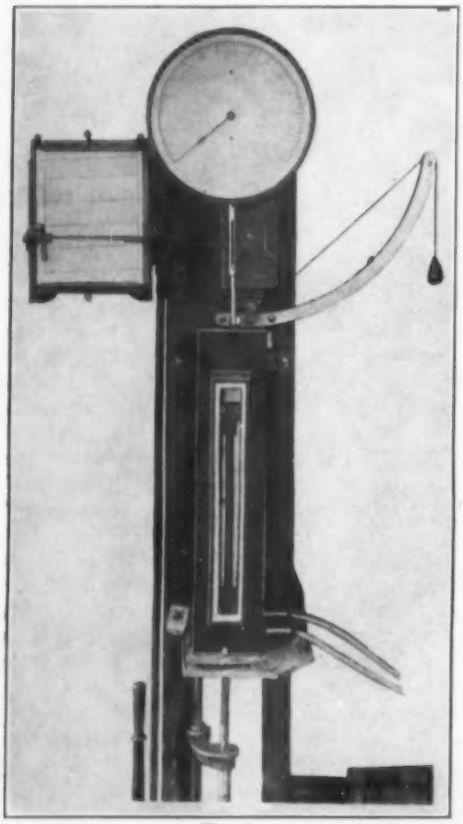


Fig. 1

The question I want to discuss is this: Did C. R. Boggs of the Simplex Wire & Cable Company discover anything that is of any real commercial importance or value to the rubber industry when he did his first work on Selenium in connection with rubber? In answer to that question I want to tell you about some of the laboratory work that has been done this past year (1928) on the use of Selenium in rubber.

Last September in talking before the Rubber Division of the A. C. S. at Swampscott, Mass., an attempt was made to show that when tests are made on rubber at both 0° and 100° C. the best results are obtained when about 2 or 3 per cent of sulphur is used on the rubber; also that overcures show up much more prominently when the stock is tested at 100° than when the stock is tested at 0°. Pictures were shown of a testing machine equipped for making stress-strain tests at 0° and 100°, and also pictures showing the spread between the stress-strain curves of ordinary rubber compounds when tested at 0° and 100°.

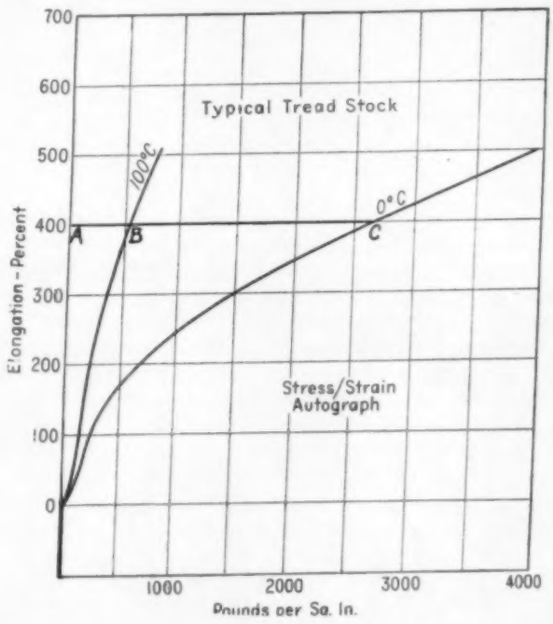


Fig. 2

In Figure 1 is shown the Scott machine equipped with a tank to hold water so arranged that the rubber test piece can be stretched in the water at a temperature approximately either 0° or 100°, that is, freezing or boiling.

If samples of rubber in the form of a circular test ring are stretched at 0° and 100° by means of this machine, what is known as a stress-strain curve can be drawn automatically, and if the curves are drawn at different temperatures on samples cut from the same sheet of stock, the position or location of the stress-strain curves varies according to the temperature. The stress-strain curves drawn for an ordinary tire tread are shown in Figure 2.

It was also shown that if a stock is overcured it may still give a splendid test at 0° or at room temperature, but when tested at 100° C. it breaks exceedingly short, as is indicated in Figure 3.

Those last two figures show what was merely a diagnosis of an existing condition which might be termed one of the ills of present rubber goods compounding. There was nothing said at that time with reference to prescribing a remedy or medicine to overcome the ill.

It would seem that it might be highly desirable to bring those two 0° and 100° stress-strain curves more closely together; in other

NOTE.—Paper read before the N. E. Section A. C. S. and the Boston Group, Rubber Division, A. C. S., January 12, 1929, at Boston, Mass.

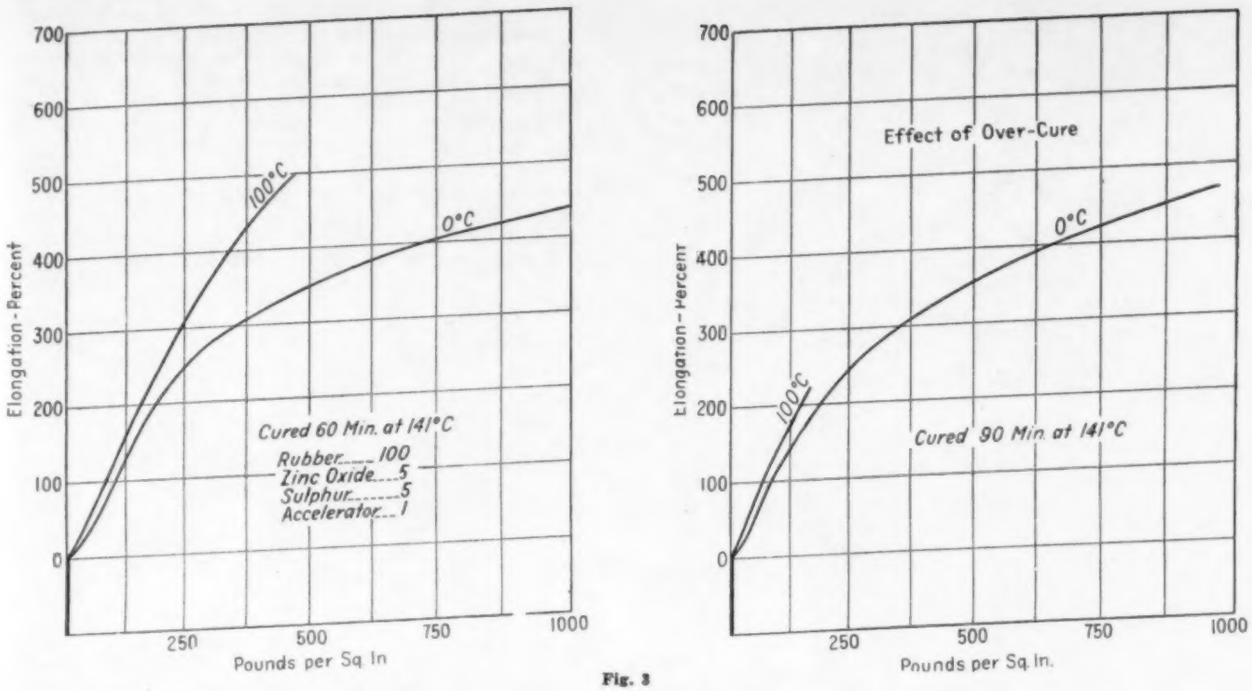


Fig. 3

words, to make a rubber compound that would test nearly the same at either 0° or 100°. It is quite possible to make compounds having such properties that the stress-strain curves drawn at 0° and 100° actually cross—where the stress at 100° is actually higher than at 0° at certain elongations of the rubber test piece.

The compound producing the curves shown in Figure 4 consists of rubber, together with small amounts of zinc oxide, sulphur, stearic acid, accelerator and Selenium.

There are, I believe, three distinct ways of making rubber compounds that will, when tested at 0° and 100°, show a crossing of the stress-strain curves. It can be accomplished in the case of the so-called pure gum stocks by using a very small amount of sulphur, 1 per cent to 1½ per cent on the rubber, and driving that sulphur home by a big amount of accelerator. Such stocks are not claimed to be particularly good for any purpose, though they can be made to show a crossing of the 0° and 100° stress-strain curves. At the same time there is great danger of overcuring, and of either having the stock break extremely short at 100° C. or of suffering reversion and consequent softening of the stock.

A second method of making a stock that will give a crossing of the 0° and 100° stress-strain curves is to use tetra-methyl-thiuram-disulphide as a vulcanizing agent, using it to replace both the sulphur and accelerator ordinarily used. Such a compound is unusually expensive although it should also be said that it has most unusual heat aging qualities, and will stand an unusually long cure without being overcured or without breaking short when tested hot.

The third method of producing this crossing of the 0° and 100° stress-strain curves, the one which so far has been found to be the surest, most practical, and most effective, is by the use of Selenium used as a secondary vulcanizing agent, in addition to a low amount of sulphur and the ordinary organic accelerator—and it is data on Selenium compounded samples made in several different rubber laboratories or factories that will be shown to you.

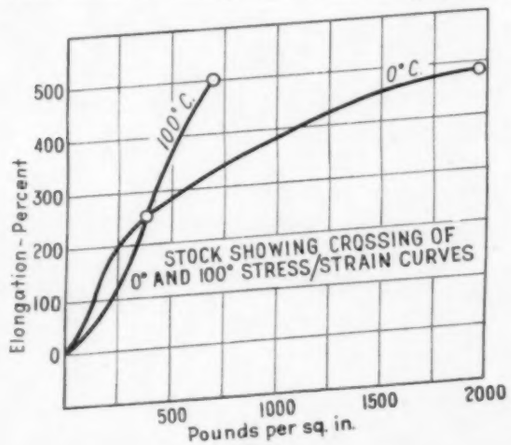


Fig. 4

It would be desirable to know the elongation to which a rubber article is ordinarily stretched in service whether that article is a tire, belt or shoe, or any part of the tire, belt, or shoe. That is something that is not known, but we do know that these 0° and 100° stress-strain curves can be regulated to cross each other at any elongation from 100 per cent to 400 per cent, depending upon the compounding and the cure given.

In Figure 5 are shown the stress-strain curves at 0° and 100° on one compound given three different cures, and you will note that the crossing of those two stress-strain curves occurs at different elongations as the cure progresses.

It should be said that we have not been able to make high stress-strain heavily compounded stocks, such as tire treads, that will show a crossing of the 0° and 100° stress-strain curves.

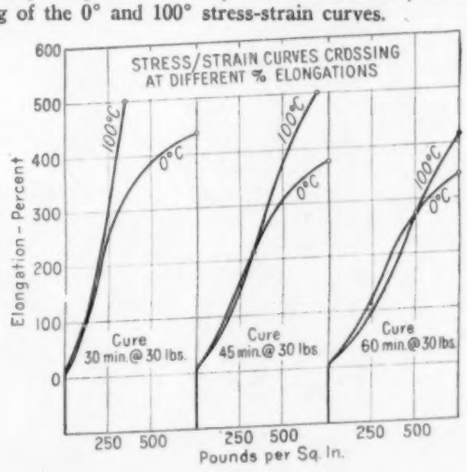


Fig. 5

Last September at Swampscott it was shown that if a strip of belt an inch in width, such as this sample in my hand, is stripped or the adjacent plies of fabric pulled apart by the usual machine method of making what is known as a friction stripping test, the pull in pounds necessary to separate adjacent plies varies according to the temperature. As the temperature increases from 0° to 100° C. the pull in pounds to strip the belt ordinarily decreases, usually as

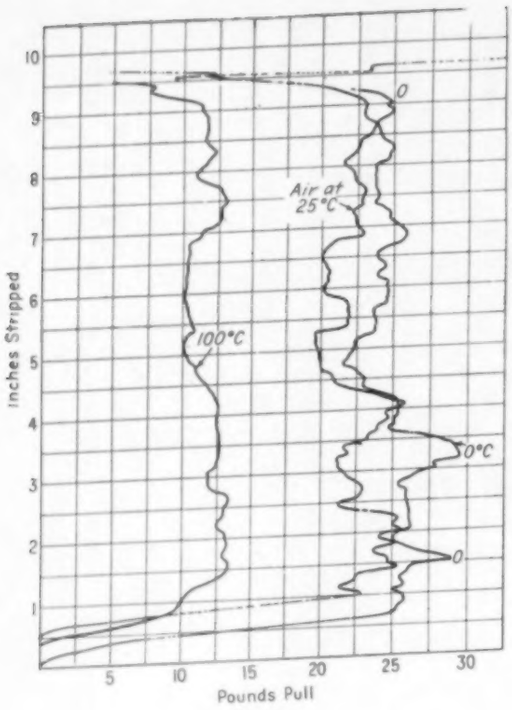


Fig. 6

much as 10 per cent to 20 per cent in high grade belts and 25 per cent to 50 per cent in second or third grade belts. In Figure 6 is shown such a test at 0°, 25° and 100° drawn automatically on the testing machine. The same data averaged is shown in another form in Figure 7.

You have previously been told that an overcured stock shows up poorly when tested at high temperatures such as 100° C. That can be shown very readily in the case of stripping a belt sample. In Figure 8 you are shown friction stripping tests at 0°, 25° and 100° on samples of belting given two different cures, one sample having had what we will term a proper cure and the other sample having had a 50 per cent longer cure. The stripping test is the same at 0° or 25° on both cures, but in the overcure when tested at 100° the stripping test falls down badly, while in the good cure the stripping test is nearly as high at 100° as at 0°, and it would do well to add here that friction stocks can be made which will show a higher stripping strength at 100° than at 0° C.

Many technically trained rubber men will say today that this old style friction stripping or pulling test is not indicative of the service that a rubberized fabric article such as a belt or tire will give in actual practice, but that a more informative test is that made possible through the use of so-called flexing machines such as that developed by the United States Rubber Company, and now manufactured commercially by Henry L. Scott Company at Providence, R. I. A picture of that machine is shown in Figure 9.

About a year ago three rubber companies very kindly made up belt samples, using two compounds, the same except that one contained an added amount of Selenium, cured those stocks, determined the proper cure, ran flexing tests on those proper cures and the

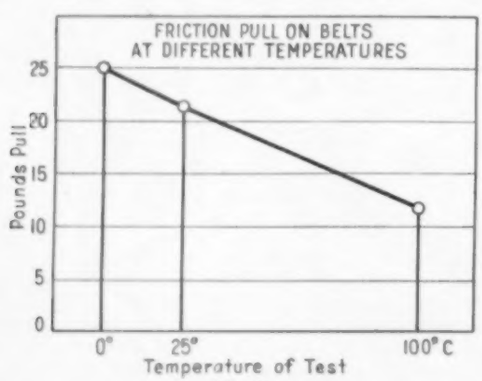


Fig. 7

average results of the three laboratories showed flexing tests about 20 per cent better in the case of the Selenium stock than of the non-Selenium stock. More recently friction stripping tests at 0° and 100° have been made, and in Figure 10 there is shown the stripping friction strength of those two compounds at three temperatures. You will note that one compound without Selenium loses in friction strength as the temperature increases, and the other compound containing Selenium gains in friction stripping strength as the temperature increases. Both samples were made in a rubber factory.

It should be borne in mind that the flexing tests were made at room temperatures or possibly a few degrees higher, not at 100°

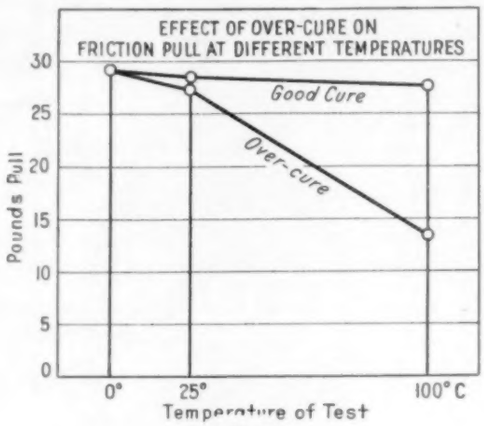


Fig. 8

where the advantage for Selenium is shown in the friction stripping tests. The compounds A and B following Figure 10 give the results shown in that graph.

Friction stripping tests at 0°, 25° and 100° have been made on another series of compounds mixed and cured in the form of belts by a second company, and that data is shown in Figure 11.

The compounds C and D following Figure 11 give the results shown in that graph, and the results obtained when tested on the flexing machine are also shown. Those flexing tests are made at room temperature. The temperature of the enclosed chamber in the testing machine is approximately 10° above room temperature. The actual temperature of the samples is not known.

Still another pair of compounds with and without Selenium made in the form of belt samples by a third company has been used in

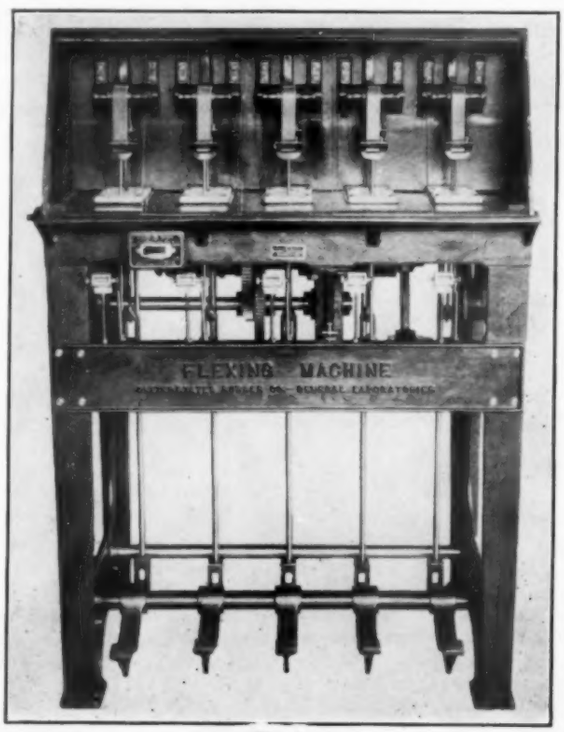


Fig. 9

making the friction stripping tests at 0°, 25° and 100° C., and the data is shown in Figure 12. The two compounds in question, together with flexing data are given below the graph.

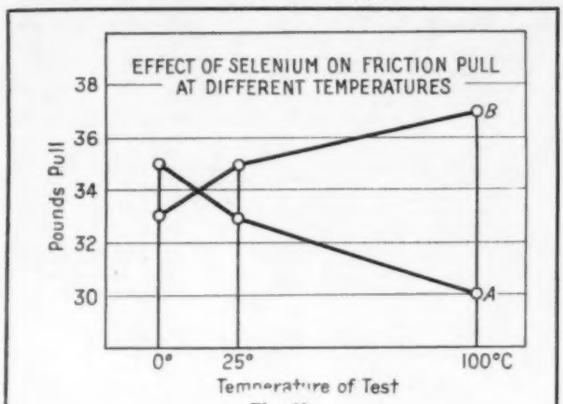


Fig. 10

	A	B
Rubber	100	100
M. R.	5	5
Zinc oxide	5	5
Stearic acid	1	1
Pine tar	2	2
AgeRite resin	1	1
Captax	.3	.3
Sulphur	3	3
Vandex	....	.5

These same two compounds have been made up in the form of tire carcass stocks and are still undergoing tests.

While it would appear from the testing machine data that the addition of Vandex Selenium undoubtedly improves both the flexing and stripping qualities of friction stocks, it should also be borne in mind that the control stocks used are unusually high grade, giving unusually good flexing qualities, and that Selenium has improved those stocks that were already unusually high in quality. It has not been a case of using Selenium to improve what would otherwise have been a poor stock.

All of that work mentioned above has been solely laboratory work, and it may be said that laboratory machines do not always duplicate service conditions. It is a more simple matter to test small belts, such as an automobile fan belt. Automobile engineers have designed a machine for testing fan belts, and this machine duplicates actual service conditions, aside possibly from dust and oil, so closely that the results obtained by the use of that testing machine should compare very closely with actual wearing tests on belts in actual service on automobiles.

The fan belt testing machine consists simply of an electric motor with four driving pulleys on the shaft which furnishes the power for operating four belts simultaneously. These four belts operate over four independently driven pulleys. The belts are under tension and

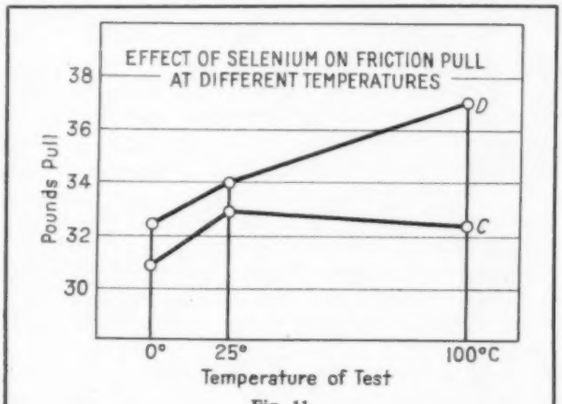


Fig. 11

	C	D
Rubber	100	100
Zinc oxide	5	5
Stearic acid	1	1
Vinegaire tar	3	3
AgeRite powder	1	1
Captax	.5	.5
Sulphur	3	2
Vandex	....	1
Cure at 30 lbs.	Flexing Cycles	
30 Min.	139,000	232,000
50 Min.	170,000	249,000

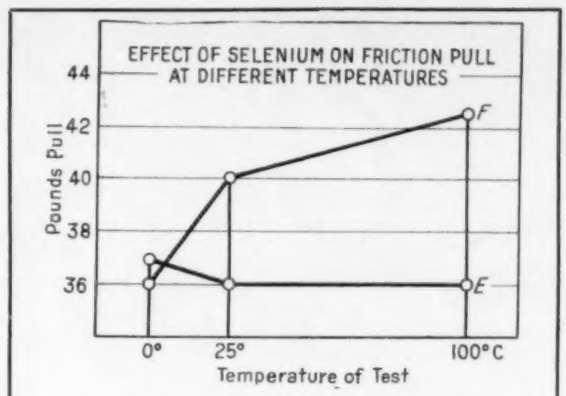


Fig. 12

	E	F
Smoked sheets	100	100
M. R.	5	5
Zinc oxide	5	5
Stearic acid	1	1
Pine tar	2	2
AgeRite resin	1	1
Captax	.5	.4
Sulphur	2.75	2.5
Vandex	....	.5
Cure at 30 lbs.	Flexing Cycles	
40 Min.	80,000	107,000
60 Min.	84,000	139,000

the pulleys are the same size as those used on an automobile. The belts under test are driven at the same speed as a belt in service when an automobile is traveling at the rate of about twenty-five miles per hour. Accordingly, the life of a belt on this testing machine should be the same in hours as when the belt is used in actual service on the automobile. The machine is shown in Figure 13.

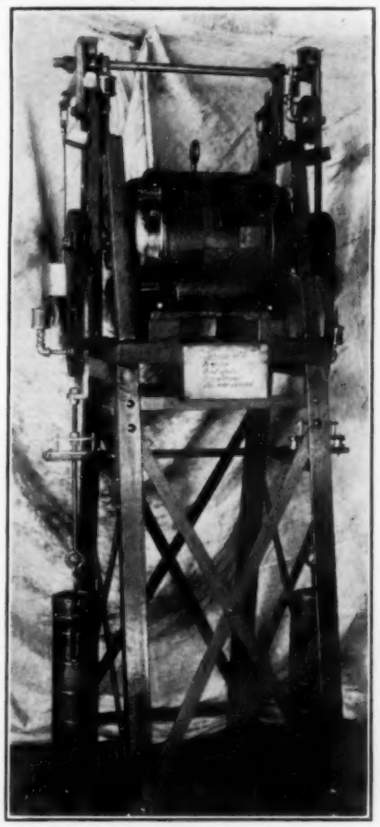


Fig. 13

A company manufacturing fan belts has by means of this testing machine greatly increased the life of its belts through improved compounding and construction methods so that the life of its fan belts on this testing machine has now reached about 800 hours or equivalent to 20,000 miles on an automobile. About three months ago they began to experiment with Selenium. Their first experiment was that of simply adding Selenium to what was already their best compound and shortening the time of cure. The first belt made with the addition of Selenium to the rubber compound has now run a total of 1,728 hours (which is the equivalent of about 43,000 miles) and was still running yesterday in good condition.

Discussion

MR. BIERER (Chairman):

I think we will all agree that Somerville has again demonstrated that he knows how to talk and that we did not make any mistake in urging him to speak here today.

In confirmation of the figures which you have just been shown, let me say that just this last week at the Boston Woven Hose & Rubber Company we have completed an experiment wherein we reduced the sulphur slightly in one of our high grade belt friction compounds, added Selenium and the flexing tests obtained through that change were more than 100 per cent better than those given by the regular commercial stock.

MR. MORSS (Simplex Wire & Cable Company):

Selenium will not vulcanize rubber without an accelerator. Therefore,

rubber was not vulcanized with Selenium by Mr. Boggs until after he developed his accelerator in 1913. Our patent application was filed early in 1914 and resulted in two patents, one issued in 1917 and the other in 1920.

Rubber vulcanized without sulphur with Selenium and an accelerator showed much longer life than the same compound vulcanized with sulphur, but owing to the extra cost it was some years before we found a commercial application. In 1925 we improved the wearing qualities of our Tirex cable by vulcanizing the rubber with a mixture of Selenium and sulphur, and during the past three years our consumption of Selenium has averaged a little over 1,000 pounds per month.

It so happens that we are also interested in Selenium from quite a different standpoint; that is, its really marvelous properties as a flameproofing material. In the Fall of 1923 we had the problem of producing a wire covered with rubber and a cotton braid, which should not carry fire. We gave this problem to Arthur D. Little, Inc., and the actual work was done by Mr. Crocker of his staff, and they solved the problem by the use of Selenium and the process was covered by patent application in February, 1924.

At this time the market price of Selenium was about $2.00 per pound and the 1924 production was only about 200,000 pounds, and the producers were selling it as fast as they could get it, largely for the production of red glass. There was apparently going to be so much difficulty in obtaining any considerable quantity of Selenium that in June, 1924, I asked the purchasing agent of the Western Electric Company of London to see if it could be obtained in Europe. He reported that he could buy it there at about $2.25 per pound, but that it would be imported from this country.

After buying several small lots we tested out the possibility of obtaining a supply by ordering 300 pounds per week for eight weeks. As our expected demand for Selenium for flameproofing purposes did not materialize, we accumulated a little over 3,000 pounds by the end of 1924. For the moment this appeared to be something of a white elephant on our hands, but it came in very handy when we began to use Selenium for vulcanizing rubber the next year.

Having found that Selenium toughened the rubber on cable, it immediately occurred to us that it could be used to great advantage in tire treads, but if so used the demand would be greater than the supply. On the theory that a supply of any material can always somehow be found to meet a demand, we made a strong effort to find a source of supply for a considerable quantity. Not only did we write to possible suppliers all over the world, but we also advertised in the *Engineering and Mining Journal*. As a result, one man appeared who said he could produce 200 tons of Selenium additional per year, and as yet we have not been able to furnish him sufficient orders to satisfy him. A little later another responsible man claimed that he could produce 100 tons of Selenium per month, but so far we have not demonstrated whether or not he can make good because we have not been able to offer him a market.

While Selenium has never yet been produced in large quantities, it is my opinion that we shall find a way to supply the rubber manufacturers with all they may need.

MR. GLIDDEN (Hood Rubber Company):

A little work has been done in the laboratory at the Hood Rubber Company by Mr. Reed under the direction of Mr. Glancy. In a typical tread compound 2 per cent on the rubber of Selenium was substituted for 1 per cent of sulphur. In other cases varying amounts of sulphur, Selenium and accelerator were used. In still another case we used rather high amounts of carbon black, and substituted 45 per cent of the weight of sulphur with Selenium. Without going into details of the elongation, resilient energy, etc., the results can be summed up in a general statement that Selenium shortens the time of optimum, gives a somewhat higher tensile and considerable increase in hardness. The aging was slightly better than that obtained in the control compounds. This suggests the important point that greater production may be obtained from a given amount of equipment.

I do not know that any work has been done on inner tube stocks, but I think that a greater production of molded tubes might be obtained having less difficulty with their aging properties. The results that we obtained, while not comparable with those shown by Dr. Somerville, gave a hardening or stiffening effect in the rubber, and this may account in some degree for the improved life and adhesion obtained by him. Mr. Boggs and Mr. Follansbee, in a very interesting paper published in 1927, suggested that further work be done regarding the mechanics of sulphur and Selenium vulcanization.

The older men engaged in rubber work and those like myself, not educated as chemists, have always considered the melting point of sulphur as an important point around which to work. Selenium melts at comparatively high temperatures, 216° C. or 420° F, sulphur melts at between 230° and 240° F. It would be interesting if we could have some discussion on this phase of the subject.

MR. BIERER:

There is one company represented here that has done a great deal of work on Selenium in the manufacture of rubber belting.

MR. SCHILDHAUER (Manhattan Rubber Mfg. Co.):

During the past year we have been working with Dr. Somerville on Selenium in belt frictions. The results shown by Dr. Somerville are rather conservative since his control stock gives an unusually high flexing figure to begin with. As an example, the results of flexing tests made of the leading first grade transmission belts by a sub-committee of the A. S. T. M. Committee D-11 in making a study of the flexing machine, showed an average flexing of about 30,000.

In our own laboratory we have taken a friction stock, the flexings of which ranged from 30,000 to 85,000 at various cures, and by replacing part of the sulphur with Selenium we have increased the flexings to 150,000-200,000.

We believe that Selenium will be one of the most important compounding materials in the improvement of friction stocks in the next few years.

MR. BLAKE (Simplex Wire & Cable Company):

Last September Dr. Somerville showed that a test at 100° C. accentuated overcure. He has now shown that Selenium compounds withstand high temperatures very well. In other words, the implication is that compounds containing Selenium are not overcured, but that their elastic properties extend over a wide range of temperatures.

To appreciate this effect one should know how Selenium acts when used alone. Selenium melts at 217° C., which is above normal vulcanizing temperatures, and when rubber and Selenium are heated together at or above this melting point, nothing happens. If an organic accelerator is added, vulcanization takes place very much below the melting point of Selenium. Selenium is soluble in rubber to the extent of about 0.5 per cent at vulcanizing temperatures, which is one of the reasons why Selenium can act as a vulcanizing agent at temperatures far below its melting point.

All attempts to make hard rubber by using Selenium as the vulcanizing agent are absolute failures. No matter how much Selenium is used or how severe the cure given the mixture, one cannot get a product that at all resembles hard rubber. With sulphur the case is different, as both soft and hard rubber can be obtained. In other words, sulphur plays a double role in the vulcanization of rubber, while Selenium can play only one role.

Soft rubber and hard rubber are two distinct products. The intermediate product which varies from overcured soft rubber to semi-hard rubber ages very poorly, and in most rubber compounds it is desirable to avoid this intermediate stage in vulcanization. Furthermore, hard rubber is essentially a plastic substance quite sensitive to temperature changes, while properly cured soft rubber is essentially elastic and shows a minimum change in physical properties with temperature. This accounts for the results of tests at 0° C. and 100° C.

If the above statements are true, then it is not surprising that compounds vulcanized with a mixture of sulphur and Selenium, in which the sulphur is reduced below its over-curing point, should show abnormal properties. They can produce a soft vulcanized rubber which is completely cured without being overcured. That, I think, is the explanation of Dr. Somerville's results.

MR. GLANCY (Hood Rubber Company):

I would like to ask whether the Selenium bloom can be controlled.

DR. SOMERVILLE:

We know very well that if one is working with a compound containing sulphur and when given a certain cure it shows a sulphur bloom, as Selenium is added to the compound it is going to show a Selenium bloom, a green bloom instead of a gray bloom. We think that it is the sulphur bloom which comes out to the surface and brings with it the Selenium bloom. We think that ordinarily if the compound contains a rather low percentage of sulphur, say 2 per cent on the rubber, as much as 1 per cent of Selenium may be added without any Selenium bloom resulting, but I am not going to guarantee it.

Compact Tube Repair Unit

A NEW tube repair plant designed for the use of tire dealers and in garages and filling stations, providing an economical and compact outfit for small tire dealers and service stations who may not be in position to install more elaborate equipment has been introduced to the trade by the Goodyear Tire & Rubber Company.

The Goodyear Tube Repair Unit

The unit has been assembled with all the necessary items that are approved by the Goodyear Company and that are required for a complete tube repair outfit, and includes a baked enamel finish all-steel cabinet, provided with a shelf and a latching door with provisions on the door for metal pockets to hold tools. A wide metal last is also provided on the cabinet for holding tubes during the preparation of a tube repair.

An approved inverted type two-clamp tube plate is mounted on the cabinet by means of an iron bracket. The plate has the tube clamps so designed that they may be set adjacent to each other for curing long injuries in a tube. The curing face of the tube plate measures five inches by 16 inches, and is heated with a dry heat electric heating unit with the latest type of approved thermostatic control. It is designed to operate on 110 AC or DC electric current.

A small buffing motor with a fine emery wheel is attached to the top of the cabinet. The motor operates by plugging in to any 110 volt lighting circuit.

This small, compact outfit makes tube repairing practicable for even the smallest dealer whose space may be limited.

American Tires Around the World

United States Manufacturers Must Adapt Themselves to Unusual Trade Practices in Order to Compete Successfully in the Lucrative Foreign Market

By P. W. BARKER
Assistant Chief, Rubber Division,
Bureau of Foreign and Domestic Commerce

Electric Sign Advertising American Tires in Osaka, Japan

THE rubber tire gave the world the modern automobile! And the United States has played the leading role of manufacturer not only of the vehicle, but also of the rubber tires upon which the vehicle depends for its mobility. Aside from supplying the tremendous domestic requirement, our tires year after year continue to find lucrative export markets.

In the past year United States exports of rubber tires (including inner tubes, tire repair materials, and tire sundries) were valued at over $41,000,000. Our tires make their way to the very ends of the earth as well as to the centers of civilization; witness these names as declared export destinations: Iceland, Arabia, French Guiana, Iraq, Ethiopia, Malta and Gozo, and Belgian Congo.

Business Followed Trade Routes

A brief study of United States tire exports in 1928 gives the favorable impression that American salesmen followed world trade routes and successfully competed with all rivals. Following a southern course, Mexico was the first port of call, where tires to the value of $1,600,000 were sold; and then by natural ocean routes the other southern countries in the Western Hemisphere were visited in turn with cargoes of tires of American manufacture. Central America required $700,000 in cash to pay its tire bill in 1928; the West Indies, $600,000; Cuba, $1,600,000; Porto Rico, $1,000,000; and all of South America, $7,800,000. American tires crossed the Atlantic, were sold all over Europe ($15,900,000), passed through the Suez Canal to Asia and adjacent islands ($7,000,000), and by ocean carriers to all the ports of Africa ($1,700,000), and Australia and Oceania ($1,000,000). So close to home as to be considered almost in the character of domestic markets are Canada, Miquelon and St. Pierre, Newfoundland and Labrador, and Hawaii, to which the United States shipped $2,200,000 worth of rubber tires and kindred products in the past year.

That these excellent results of American salesmanship were achieved even in the face of severe competition, goes without saying. Some of our customers are also manufacturers of tires and as such are our competitors in their own lands and in export markets. French, Canadian, British, Italian, Belgian, German, and Japanese automobile tires are encountered at every hand, for in 1928 these seven countries exported approximately 5,800,000 automobile casings to other countries. Another factor deterrent to exports from the United States has been the establishment and operation of subsidiary American tire factories in important foreign markets. Of course, the tire business of such factories is still in the hands of American tire companies; but our export salesmen are compelled to work undeveloped territories for their livelihood, and United States tire exports suffer a temporary decline.

Generally speaking, the competition met has been fair, but several interesting exceptions have occurred. In one instance the local distributor of an European tire secured some worn and abused tires of United States manufacture. He then proceeded to advertise them. A brass band, mounted in carnival array on a large motor truck, was driven through the city streets playing stirring airs, while a sign compared the worn American tires to the tires handled by the distributor. In fairness to the foreign manufacturer, it might be said that this very questionable advertising campaign was without his sanction or knowledge. Frequently, as in this country, automobile distributors substitute competing foreign brands of tires for the United States product which has been sold as original equipment, thus defeating our opportunity for replacement sales.

Secret rebates, advertising support, unusual credit terms,

Advertising American Tires in the Bullring at Barcelona, Spain

Note: Photographs by courtesy of United States Rubber Company, New York City.

and frequent price changes, have rendered it extremely difficult for any small tire company to keep abreast of the constantly changing market conditions in foreign countries, and the bulk of our export business is in the hands of a few powerful companies. This same development, however, is not a new phase in the economic structure.

Unlike the life of man, the life of the rubber tire is never ended. After collapsing from the utmost faithfulness in arduous service, the worn tire is called upon again and again for additoinal labor and servitude. A familiar second use, of course, is to scrap for the manufacture of reclaimed rubber. Man's ingenuity, however, has devised other forms of labor for the worn automobile casing. Lengths of the tire cut to fit the feet of peasants, a strap fashioned from the tire carcass, and the addition of a cheap buckle, results in a makeshift but serviceable shoe capable

A Tire Station on the Beach at Vera Cruz, Mexico

of hundreds of miles of travel. The peasantry of Spain, Greece, Mexico, Japan, and other countries have used such rubber sandals. Tire boots, blowout patches, and tire flaps are often made from the carcasses of worn casings. An old inner tube also serves man long after its original usefulness is ended: elastic bands, garters, suspenders, tire patches, and other rubber accessories are readily made from worn inner tubes.

Old Tires Find Many Uses

Necessity and inventiveness have fashioned many other purposeful articles from old tires and tubes, entirely too numerous for mention here. The better portions of discarded solid tires also are salvaged, cut into blocks, and secured to the rims of motor trucks to serve another period of usefulness. It has been stated that American-made tires by reason of the excellence of their ingredients are esteemed even in the worn-out condition for the remanufacture of these crude rubber products.

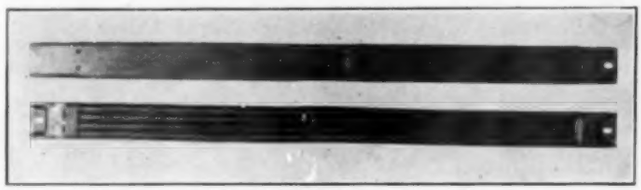
Reports from American consular and commercial representatives abroad tell of continuous progress being made by American tires, and in the present year our tires should reach every part of the world—even unto the desert places.

Electric Strip Heater

A NEW electric strip heater announced by the General Electric Co., Schenectady, N. Y., may be applied either as an air heater or as a "Clamp-on" device. It is designed for general purposes where electric heat is required, such as in process machines, drying ovens, compound tanks, warming tables, glue tables, dryers, etc.

The device is 24 inches long, 1½ inches wide and ⅜ inch thick. It is rated 500 watts at 110 or 220 volts. Slots are provided in each end allowing the heater to be supported in air or clamped to a metal surface.

The current-carrying resistance wire inside the sheath is the usual nickle-chromium resistor wound in a helix in much the same manner as in standard G. E. sheath wire construction. The coil is supported at each end by a porcelain insulator and is stretched down the length of the unit



four times, providing even distribution of heat over the entire surface of the unit.

The resistor is insulated from the sheath by magnesium oxide powder. After the heater is assembled and filled with magnesium oxide, the powder is compressed into a compact mass by a 250-ton press. At the same time four ridges are produced in the top side of the unit and these, together with depressions between, place each of the four heater windings in what is essentially individual half-tubes, adding strength and rigidity to the unit.

Cash Dividends in the Rubber Industry

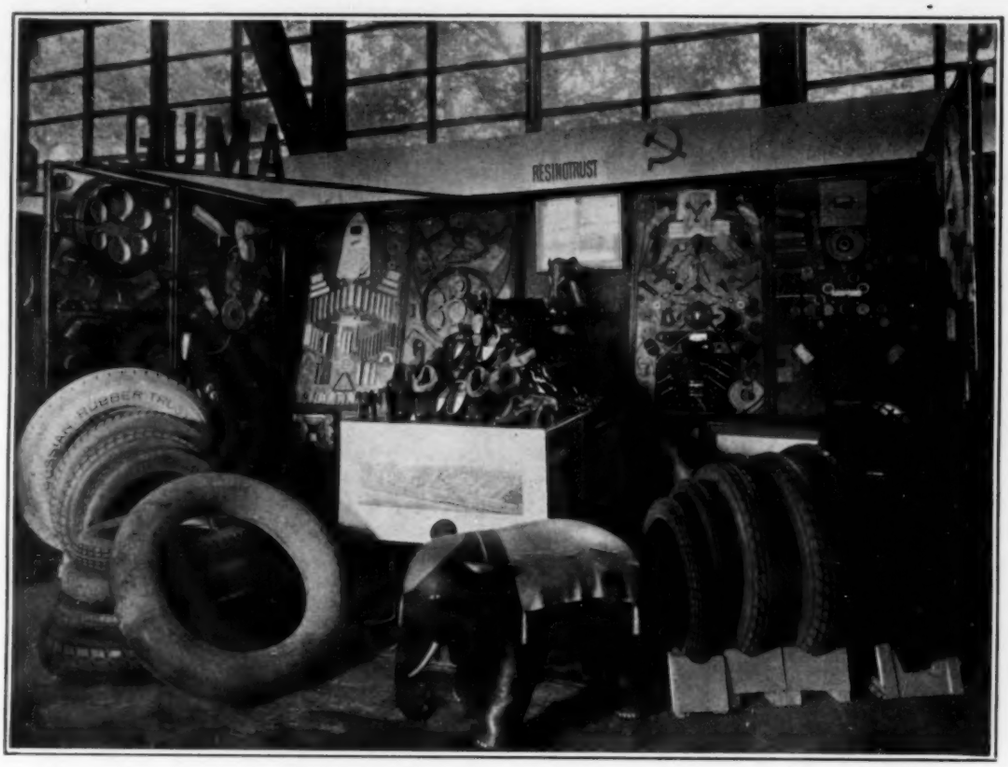
CORPORATIONS in the United States in 1926 in the aggregate paid out a greater proportion of their total receipts in cash dividends than in either 1925 or 1923, the two preceding "good" years, but manufacturing companies did so in spite of the fact that they were operating on perceptibly narrower profit margins on sales, according to an analysis of income returns made by the National Industrial Conference Board, New York. The year 1926 is the latest period in which full records are available for analysis purposes.

Manufacturing corporations in the aggregate distributed 4.1 per cent of their gross income as cash dividends in 1926, which compares with 3.6 per cent in 1925 and 1923, and 3.5 per cent in 1924. The average rate of profit to sales decreased, in spite of the progressive increase of manufacturing operations in the three good years, 1923, 1925 and 1926, and the opportunity to achieve lower unit-costs because of the greater production and a fairly stable or declining price level.

The proportion of manufacturing corporation receipts distributed as cash dividends in 1926, as in previous years, was close to the average proportion of receipts paid out as dividends by all corporations, the total cash dividend disbursements of all corporations amounting to 4.2 per cent of the aggregate total receipts.

Average cash dividends in major manufacturing divisions in 1926 ranged from 2 per cent to 6.7 per cent of receipts. It is interesting to note that the aggregate cash dividend disbursements and capital increment, the latter being the amounts set aside as surplus after payment of operating expenses, taxes, interest, depreciation and cash dividends, for various manufacturing groups, in terms of per cent of total aggregate receipts for each respective industry in 1926, were as follows:

Leather products, 2.0 per cent, 0.4 per cent to surplus; rubber products, 2.6 per cent, 0.2 per cent to surplus; lumber and wood products, 4 per cent, nearly one-fourth of which was paid out of previous surplus; paper and pulp products, 3.4 per cent, 2.7 per cent to surplus; chemical products, 6.7 per cent, 3.5 per cent to surplus; stone, clay and glass products, 6.1 per cent, 3.3 per cent to surplus; metal products, 4.8 per cent, 3.2 per cent to surplus; all other manufacturing branches combined average 4.7 per cent in cash dividends and 1.2 per cent to surplus.



Products of the Soviet Rubber Industry

The Soviet Rubber Industry

By J. ULITZKY
Member of Supreme Economic Council, Moscow

THE Russian rubber industry dates from the nineties of the last century. By 1913 the industry had attained considerable proportions, producing about 28,000,000 pairs of rubber footwear and small quantities of other rubber products. After passing through a period of decline during the war years the Soviet rubber industry has not only recovered its former position but at present has an output considerably above the maximum pre-war figures. A technical reorganization of industry, which is expected to result in a greatly increased productivity per worker, has recently been undertaken.

The several factories producing rubber products in the Soviet Union are all supervised by the Resinotrest, the Rubber Trust, which handles both the producing and the distributing ends. The Resinotrest operates four factories, the Krasny Treugolnik (Red Triangle), at Leningrad, employing 16,000 workers; Krasny Bogatir (Red Giant), at Moscow, with 5,000 workers; Krasny Kauchuk (Red Rubber), at Moscow, with 1,000 workers, and a small factory with 600 workers, which produces semi-manufactured products. The administration of the trust is located at Moscow.

In 1925-26, 25,302,800 pairs of rubber footwear were produced. Production of rubber footwear increased 22 per cent during the past year, tires 81 per cent and other rubber products 50 per cent. The increase in the production of tires by weight was still greater, since during the year the rubber factories produced considerable quantities of tires for buses, while previously few such tires were manufactured. The rapid increase in the output of automobile tires is an indication of the steady progress being made in the introduction of motor cars into the country.

Soviet rubber output has developed very rapidly during the past few years. Nevertheless the demand for rubber footwear, tires and other rubber products has grown so fast that the supply is still somewhat below the demand. The output of the rubber trust during the past two years was as follows:

	1926-27	1927-28
	(Fiscal years beginning October 1)	
Rubber footwear, pairs	29,633,700	36,248,000
Tires, units	294,000	532,000
Other rubber products, metric tons	5,674	8,500

The total value of the output of Soviet rubber factories in 1927-28 was 171,000,000 rubles, as against 150,000,000 rubles during the preceding year. Production costs were substantially decreased during the year, the average decline amounting to 15 per cent in spite of an increase in wages. A 10 to 12 per cent reduction of production costs is planned for the current year. Of the total production of Soviet rubber factories during 1927-28 the "Red Triangle" accounted for 70 per cent and the "Red Giant" for 21 per cent. Rubber footwear constituted 65 per cent of the value of the entire output, tires 8.8 per cent, other rubber products 23.6 per cent and asbestos products 2.6 per cent.

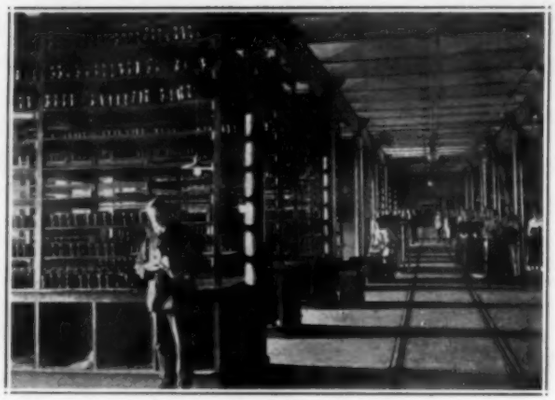
By 1926-27 the pre-war production of footwear had already been exceeded, while the output in 1927-28 was about 32 per cent above the pre-war total. During the current fiscal year, beginning October 1, 1928, the program calls

for an output 50 per cent in excess of the pre-war figure. Since the population of the Soviet Union is now about 8 per cent above that of 1913, the annual per capita consumption of rubber footwear is estimated at about 25 per cent more than the 1913 figure. In 1913 the per capita consumption of rubber footwear was 0.20 pairs and in 1927-8 0.25 pairs. For 1928-29 the figure is expected to increase to 0.27 pairs, 35 per cent above the pre-war per capita consumption.

The achievements of the rubber industry in modernizing the production processes have been considerable in the past two years. Whereas the industry formerly employed machinery only to a very small extent, practically the entire process being carried out by hand methods, at present many of the processes are machinized. The workers are now being organized into groups in which complete division of labor has been established. Conveyor systems have been introduced in a number of departments. The productivity of labor has increased considerably as the result of these measures, and will undoubtedly show further increases with the completion of the reorganization of production methods which is now taking place. In 1927-28, although the output of footwear increased 22 per cent and of tires 80 per cent, the number of workers was increased by only 11 per cent. The reduction of costs effected in the rubber industry has resulted in prices of rubber products being considerably lower than the general industrial price level. The price index on rubber products (1913=100) averaged 161 last year and is expected to show a decline this year, while the index for all industrial products was 187.7.

The Soviet rubber trust is making plans for the further expansion of the industry, which involve the construction of a number of new factories. It is planned to construct in the near future, either at Moscow or Yaroslavl, a special tire factory and a factory to produce tire fabrics.

While the Soviet rubber industry has experienced no difficulties in importing the crude rubber required, it is felt that measures should be taken to establish domestic production of crude rubber in the southern sections of the country. Soviet scientists are now conducting a series of experiments on acclimatization of rubber plants in the region of the Black Sea. Experiments show that the plant guayule can be grown in the sub-tropical regions on the shores of the Black Sea.



Warehouse of the Resinotrest

Exports of rubber products have been increasing at a rapid rate. While in 1925-26 exports amounted to 1,300,000 rubles, in 1926-27 they totaled 2,000,000 rubles and in 1927-28 4,500,000 rubles. The bulk of exports consist of footwear. Last year the principal countries to which Soviet rubber exports were shipped were Persia, which took 57 per cent of the exports, Afghanistan, Western China, Turkey and Austria.

From a financial standpoint the Rubber Trust is one of the most profitable of Soviet industries. In 1925-26 its net profits amounted to 19,600,000 rubles and in 1926-27 22,000,000 rubles. In 1927-28 profits were expected to be somewhat larger than in the preceding year.

The program of the trust for 1928-29 provides for an output valued at 213,000,000 rubles, an increase of 22 per cent over 1927-28. Production of rubber footwear is expected to reach 42,000,000 pairs, 12 per cent more than last year. A large expansion of tire production has also been scheduled for the current year. Judging from the experience of past years, in which the rubber industry has always come very close to the production schedule, there is every reason to believe that this year the production program will also be carried out.

With the increase in the demand of the Soviet population for rubber footwear, the development of automobile travel in the Soviet Union and the increased demand of industry for rubber products, the Soviet rubber industry should show a steady and rapid expansion during the next few years.

Krasny Treugolnik (Red Triangle) Rubber Shoe Factory in Leningrad

Goodyear Starts Planting *in the* Philippines

Plantation Cultivation of Rubber Under the American Flag Is Well Advanced With Modern Machinery Being Used to Conquer Jungle

J. J. BLANDIN
Manager of the Crude Rubber Department of the Goodyear Tire & Rubber Company, Akron

SHORTLY after the imposition of restrictions by the British Government in connection with the free export of crude rubber, certain interests in the United States instituted a demand for America to grow its own rubber along the lines of the British and Dutch companies but suggested a territory for exploitation removed from European tax laws and other restrictive measures. Few rubber growing areas were available under such conditions. Firestone made the first move in establishing his Liberian project. United States Rubber, Goodyear, and Manhattan had already projected producing plantations in Malay and the Dutch East Indies, areas more or less subject to voluntary restriction, but at least under the laws and regulations of a foreign mandate far removed from protection of the American flag.

The controversy over rubber growing free from British and Dutch domination reached a peak in 1922 when the United States Congress appropriated $500,000 for an investigation under the auspices of the Department of Commerce into the possibilities of growing rubber in areas under American control. The Philippines were at that time looked to as the most logical area and the commission sent to that region reported most favorably on the great resources of the Islands in this connection but recalled that the laws of the Philippines prevented larger unit holdings by any one company than approximately 2,500 acres. This seemed an uneconomical unit for propagation.

Since then the Goodyear Tire & Rubber Company, in addition to their Malayan and Sumatra plantation project have now entered the Philippines with an experimental plantation unit in the Cotabato province of Mindanao, four days' trip from Manila.

Alexander Muzzall, one of the members of the United States commission of the Department of Commerce to

Left to Right, Above: Bagobo Moro, native of Cotabato Province; J. J. Blandin on a road in the Kabasalan Estate; Cebu Laborers on the wharf at Zamboanga; Judge Marainag, the Captain of the Constabulary and Deputy Governor of Malaybabay.
Below: Launch used for transportation between Zamboanga and Kabasalan; Moro troops of the U. S. Army at Zamboanga; Cebu labor being transported from wharf to quarters at Zamboanga.

make the favorable report of the growing of rubber in the Philippines, is in charge of the work in the Philippines.

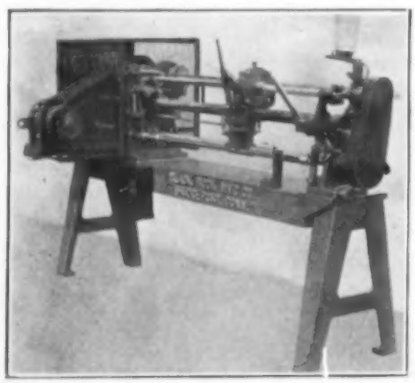
The entire tract of 2,500 acres should be cleared and planted by the end of 1930.

J. J. Blandin, manager of the crude rubber department, of the Goodyear Tire & Rubber Company, Akron, has just returned from a visit to the Philippine project.

He says: "Motor trucks are being used instead of bullocks, and there is some motor driven machinery but the conquering of the new jungle is a job. The only difference is that in the Philippines as contrasted with Sumatra the jungle is second growth and the timber is not so heavy." Steamers from Zamboanga carry all supplies to the new plantation development. These supplies have to come largely from Manila to Zamboanga for trans-shipment.

Washer Cutting Machine

THIS universal washer cutting machine, designated as Type 4-H, is a recent development of the Black Rock Manufacturing Company, 177 Osborn Street, Bridgeport, Conn. It is said to be an improvement over the company's standard washer cutting machine 4-A and duplex jar ring cutting machine 4-B as it has done away with rubber covered mandrels and the use of the air stripping machine 4-C.



The work is cut at the end of a rotating steel mandrel on which it is slidably mounted. The cutting is done by a circular knife driven at high speed and will cut rubber washers, jar rings, friction tape, rubber electrical tape, asbestos rings, and, in fact practically any material where it is desirable to cut rolls or tubes into smaller pieces. The machine is motor driven in such a way that a number of work and knife speeds are obtainable, and the range of work is so great as to be difficult to describe in full.

The machine has a net weight of about 1,650 pounds and covers a floor space of 31 by 90 inches. Its total height is 52 inches. Each machine is equipped with five pairs of gears, each pair for a different width of cut; three steel mandrels, each for a different inside diameter; two knives, suitable wrenches, a setting up diagram, and a one H.P. 1,800 R.P.M. motor with starting box.

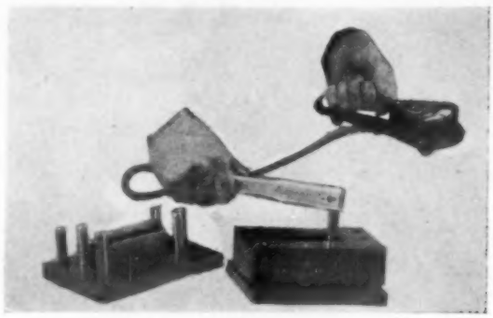
New Cambridge Mold Pyrometer

A NEW Cambridge mold pyrometer, manufactured by the Cambridge Instrument Company, Inc., New York City, has been developed at the suggestion of the Bakelite Corporation and in close cooperation with their engineering staff. The instrument provides an accurate and convenient means for quickly determining the inside surface temperature of molds and of the heated surfaces of the presses.

In the manufacture of plastic articles in heated molds, satisfactory results are dependent on the maintenance of the temperature within limits dictated by the nature of the material being molded. The instrument is therefore of considerable value to the rubber industry for ascertaining the correct temperature of all press and other molds.

It has also a wide field of utility in other manufacturing operations where it is necessary to quickly and accurately ascertain surface temperatures.

The Cambridge mold pyrometer consists of a sensitive, thin, flat-strip thermocouple element, connected to an indicator reading directly in degrees. The contact element



Cambridge Mold Pyrometer

is protected by a short insulating tube adjustable through a wide angle to permit its use on molds or other objects of varied shapes and degrees of accessibility.

In operation, the element is held in one hand and applied to the heated surface while the indicator is held in the other, the two being connected by a short armored cable. The reading is direct without calculation and the response is almost instantaneous.

It may be used as an insertion pyrometer for testing the temperature of field coils, etc., or as a surface pyrometer for flat and curved surfaces such as bearings, motor and generator parts, low tension bus bars, high tension cables and all places susceptible to a critical rise in temperature.

For these varied purposes the adjustable angle feature

Supplied in Carrying Case

of the pyrometer element will be found a great advantage. By use of the Cambridge mold pyrometer the surface temperature is readily ascertained either by continuous tests between moldings or, where the work permits, by application of the pyrometer at such intervals as are shown by experience to be necessary. The flexibility of the contact element permits the obtaining of temperatures of the hard-to-get-at surfaces.

The cost of the Cambridge mold pyrometer with the standard range of 50-400 degrees Fahr. is $175.00. The special ranges up to 1200 degrees Fahr. can be furnished for $15.00 additional.

Mass Production in the Rubber Industry

THE statistics of production of rubber goods in the United States during 1927 released late in 1928 by the Bureau of the Census go further toward enumerating the principal items constituting the 30,000 articles which one authority claims are made of rubber than any previous report, listing as it does over 50 separate items.

Imposing as the figure of 30,000 is at first glance, it shrinks into insignificance when compared with the quantity of any individual article produced. Take for example the number of raincoats—1,885,751, the number of single tube bicycle tires—2,015,181, the number of gallons of rubber cement—4,462,975, the number of pounds of rubber thread—5,281,597, the number of square feet of rubber flooring—8,778,253, number of bathing caps—8,890,320, number of pairs of rubber gloves—9,795,825, number of water bottles and fountain syringes—13,678,008, number of pounds of friction tape—16,998,847, all of which are relatively minor products from a volume standpoint.

Even the figures of 40,820,386 pairs of rubber soles, 43,277,641 pounds of rubber belting, 52,946,794 yards of rubberized piece goods, 63,549,949 automobile casings, 70,855,455 automobile inner tubes, and 104,682,374 pairs of rubber boots and shoes of all kinds, rank low in the scale of items manufactured on the mass production system by the rubber industry which produced goods to the value of $1,224,941,390 during 1927.

The quantity of rubber heels produced—318,346,037 pairs, becomes somewhat impressive, but falls far short of the number of feet of rubber hose and tubing—430,129,958, and is also lower than the number of toy balloons—352,565,712.

Rubalt—A New Rubber Paint

A NEW brand of rubber paint is the latest imported product now being handled by Alfred Hague & Co., 130 East 42nd Street, New York City, N. Y. Rubber and bitumen dissolved in benzol are the chief constituents of this new acid, alcalin and heat resistant paint. Additional ingredients make it dry rapidly with a resultant hard surface. While in itself it is a rubber product, it, in turn, finds application in rubber plants as a protective paint.

The new paint comes in several grades, each of which emphasizes certain characteristics.

In the composition of the paint the bitumen is subjected to an artificial oxidation before dissolving, analogous to the preparation of linomeim with linseed oil. It is then combined with rubber by a special heating process. The oxidation of the bitumen removes the sulfur. Certain other ingredients are added to make the paint dry rapidly and produce a lustrous enamel finish.

The resultant paint is also a retardant of all types of corrosion.

Rubalt has extraordinary resistance to sulphuric acid, nitric acid, hydrochloric acid, alkalies, chlorine gas, caustics, sulphur dioxide gas, ammonia gas, vapors, brine, sea water, and other chemical agencies.

It provides a smooth, elastic, non-porous, watertight coating which is ideal for waterproofing wood, concrete, brick work, plaster and other porous materials. It has been found successful in lessening mould fungus and wood decay and the accumulation of plant and animal growth.

Rubalt is very elastic and flexible and does not crack or peel on vibrating or bending surfaces. It is said not to become brittle with age or temperature.

It is also very adhesive. Because of its high resistance to electric currents it affords an effective coating for metals subject to electrolytic action. A coating 1/64th of an inch thick resists an electric current up to 10,000 and 12,000 volts.

Schaphorst's CHATS *with the* ENGINEER

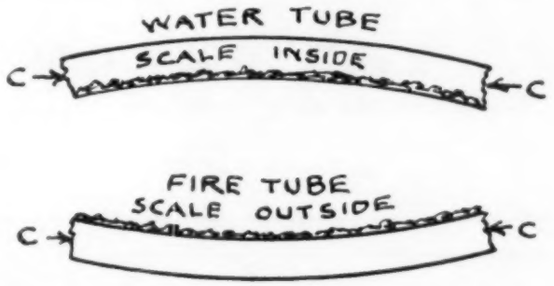
By W. F. SCHAPHORST, M.E.

Why Boiler Tubes Buckle As They Do

NO DOUBT you have observed that when tubes in horizontal water tube boilers buckle, they buckle upward. And on the other hand in the fire tube type of boiler the tubes buckle downward. Why the difference?

The sketches herewith show why the tubes buckle as they do, in opposite directions.

When the steel of which boiler tubes are made becomes heated, it naturally weakens, and therefore the hottest side is its weakest side. In the water-tube boiler the weakest side is on the bottom because the bottom is hottest. The forces "C" acting on the tube when in operation are compressive forces and are equal and opposite in direction, acting from the ends parallel with the tube. The hottest side compresses more readily than the cooler side, and therefore in the case of the water-tube boiler the buckling is upward.



For the same reason the upper side in the fire-tube boiler is the hottest and therefore the weakest side. Consequently the buckling is downward.

Another contributory cause is soot. Soot and ash always deposits to greatest depth on the top or outside of the horizontal water tube boiler. The top side is therefore insulated against heat while the bottom is not. And in fire tube boilers soot and ash deposit on the bottom or inside of the tubes. Therefore the bottom is insulated against heat while the top is not. In other words it is perfectly natural for horizontal water tubes to buckle upward and for fire tubes to buckle downward.

If the buckling were caused solely by the expansion due to the difference in temperatures on the two sides—that is, if there were no change in strength—the buckling would be in the direction opposite to that shown in the illustrations. The buckling is always away from the side of least resistance. That is, the hottest, and therefore the weakest side, always becomes concave.

A study of the theory and practice of columns will explain fully why buckling is always such that the hottest side becomes concave. However, I trust the above has been made plain enough so that anybody can now understand clearly why tubes buckle as they do.

A pamphlet under the title, "Dutch Rubber Growing Companies," printed both in English and Dutch, has been issued by the Amsterdam Stock Exchange house of Theodoor Gilissen.

Accuracy—and Careful Attention to Details!

On-Time Deliveries

You can depend upon our delivery promises. They are carefully made and lived up to rigidly.

It is essential in mold work that every specification be correctly carried out.

You have the assurance of such service in placing your work with us. We guarantee accuracy and careful attention to every detail.

Our large plant and equipment enables us to give prompt service on volume orders. We are not too large, however, to prevent our giving close personal attention to each order, large or small.

Our men are accustomed to work for the leading tire makers, whose requirements are most exacting.

May we quote on your work.

THE AKRON EQUIPMENT CO.

E. Exchange at Annadale — — Akron, Ohio

[Makers of Flynn "C" Shape Tube Molds]

TASCO XX for TREADS

TASCO X-200 for CARCASS STOCKS

TASCO X-500 for RECLAIMING

—Softeners giving improved working properties for uncured rubber stocks without degrading quality after vulcanization

TASCO ASPHALT COMPANY

238 Wilson Avenue **NEWARK, N. J.**

EDITORIAL COMMENT

Revising the Tariff

IN the light of the promises of the incoming administration at Washington the time again approaches when tariff revisions will be the order of the day and hearings have already been begun in the Committee on Ways and Means of the House of Representatives. It is understood that no changes are contemplated in the duties on imported rubber manufactured goods except in the instance of certain hard rubber products which have recently come in volume from Europe, particularly combs. A slight revision upward in this case is anticipated as a needful protection for the American product.

The rubber industry in general and the tire industry in particular has had a remarkable and interesting record in connection with American tariff legislation. A higher type of public spirit has not come from any other industry in the nation. Instead of assuming a monopolistic attitude, as far as a desire for high protection is concerned, the tire industry has ever advocated a liberal and unselfish policy. When in 1921 a proposal was generally advocated by the Congressional committee to raise the duties on all rubber goods 25 per cent, the industry responded, through the Rubber Association of America, by not only opposing an advance but asking for a reduction in the schedule. The tire industry has never sought protection and the present duty of 10 per cent ad valorem serves merely as a tariff for revenue only.

That the industry has prospered to the point of not only becoming the important factor in the industrial life of the nation that it has, but has also left a heavy imprint in the trade of the world, speaks eloquently for the ingenuity and acumen of its leaders and the fine workmanship of its labor in general. On the other hand, so effective has the industry been in marketing its product abroad that it has been other countries that have sought to erect tariff walls to render protection to their own industries. How the ingenuity of the American manufacturers have circumvented these trade barriers by the invasion of these very countries with complete manufacturing units is another story.

The Outlook Improves

WITH the situation in the rubber producing industry as unsettled as it is, there should be no wonder at the fact that there are many varying opinions on future consumption and production as there are authorities. Recent estimates for the world's consumption during 1929 differ over a range of 38,000 tons, while predictions for this year's production of crude rubber are separated by as much as 91,000 tons.

A summary of the 1929 estimates of eight leading foreign authorities follows:

	Consumption	*Production*
Faulkner & Winsor	680,000	710,000
Lewis & Peat	680,000	690,000
J. N. Burger	712,000	700,000
Dutch Official	718,000	717,000
Lane Mitchell, Ltd.	710,000	685,000
S. Figgis & Co.	696,000	700,000
Niewe Financier	.....	707,000
Chas. Hope & Son	709,000	776,000

The average of these diverse opinions would indicate that consumption this year should approximate 701,000 tons while production should be in the neighborhood of 711,000 tons. This would result in a surplus of 10,000 tons as against a deficiency last year figured at between 65,000 and 70,000 tons. The only strongly discordant note in these estimates is sounded by Charles Hope & Son, who not only look forward to a production totaling 776,000 tons but also add to that figure 23,000 tons for "abnormal shipments" to make a grand total of 799,000 tons of crude rubber to be offered to the world.

Should the average of these prognostications work out correctly, however, a firm balance between production and consumption will be struck. With supply and demand so nearly equalized, the situation in trading in the commodity should cease to develop its previous frenzied fluctuations with resulting benefits to the manufacturer of rubber products. Stabilization of price has always been the fond hope of the industry, and balanced supply and demand is the surest means to that end.

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SHORT NEWS & DEPARTMENTS

Names in the News
Rubber Goods & Specialties
Foreign Rubber News
Crude Rubber Items

FIRESTONE AWARDS $5,940 FOR PLANT SUGGESTIONS

During the year 1928, the Firestone Tire & Rubber Company and associated companies awarded a total of $5,940 for 493 suggestions of various kinds from as many employes in the organization. In all, 1,861 suggestions were submitted by workers in the course of the year, of which 1,599 came from the two Firestone rubber plants, 87 from the Xylos Rubber Company, and 175 from the Firestone Steel Products Company.

The largest awards went to R. D. Wilhelm, who received $800 for an idea last June, to Miss Nell Gardner, who received $550 for two ideas in the same month, and to William Bogley, who won $500 for a suggestion submitted in August. The year 1929 was opened with awards during January of $320 to 23 employes, the largest individual prize going to D. Doyle in the form of a check for $150 for a way of improvement in tire building.

HUBLER SEES GOOD YEAR FOR FAULTLESS RUBBER

"Prospects for 1929 are very bright," C. D. Hubler, president of the Faultless Rubber Company, declared in a recent statement on the condition of the company's business. According to Mr. Hubler, business for the first half of the fiscal year, the period from July 1 to December 31, was in excess of that for the same period of the preceding fiscal year.

All departments of the Faultless organization are busy, and several are working overtime with increased working forces. Although the company has been adding to its line, staple products continue to be the leaders in manufacturing and sales.

HUSTED SEES A TREND TO 3-SPOKE STEERING WHEEL

That the newest mode on cars is to be a slender, graceful steering wheel with three spokes instead of four is the opinion of A. H. Husted, president of the American Hard Rubber Company. Expressing his belief at the Chicago auto show, Mr. Husted, who is the designer of the Husted steel core hard rubber safety steering wheel, pointed to the three-spoke wheel introduced on the new Duesenberg and declared that the strength of modern one-piece steel construction makes it possible to eliminate a spoke without sacrifice of safety.

The three-spoke wheel, he claims, has several advantages over the conventional four-spoke type. Primarily the elimination of one spoke in the wheel permits the driver a clearer view of the speedometer and gauges on the instrument board.

Michelin Seeks Brazilian Plant

The Michelin Rubber Company, leading French tire manufacturers, have approached the government of the State of Amazonas, Brazil, for permission to establish in that state a factory for the manufacture of tires and other rubber products. At the present time there is no tire factory in South America, although Argentina and other countries on that continent are among the leading export markets for American and other tires. A native company operated a plant until 1925 but was unable to produce balloon casings successfully and abandoned its activities.

Du Pont Earnings High

The report of E. I. du Pont de Nemours & Company for the year ended December 31, 1928, shows net income of $64,097,797 after interest and federal taxes, equivalent after debenture dividends to $21.96 a share earned on 2,674,107 average number of no par shares outstanding during the year. Based on 2,811,050 common shares outstanding at the end of the year, net income is equal to $20.89 a share and compares with $45,947,832, or $15.45 a share on 2,661,658 shares in 1927. The 1928 earnings include income of the Grasselli Chemical Company for the month of December only.

Philadelphia Rubber Officers

The annual meeting of the Philadelphia Rubber Works Company was held in Akron on January 21, when it was reported that the company's business for 1928 had been the largest in its history. The following officers were elected: J. Kearsley Mitchell, chairman of the board; J. S. Lowman, president; R. S. Rauch, first vice-president; H. G. Day, second vice-president; F. J. Sullivan, secretary and treasurer; and H. W. Chaudoin, assistant secretary and treasurer.

Goodyear Awards Contract

C. F. Van Sicklan, vice-president and sales director of the Great Lakes Aircraft Corporation, successor to the Glenn L. Martin Company, announced last month that his firm has been awarded a contract by the Goodyear-Zeppelin Corporation to fabricate a million feet of duralumin strips for the framework of the two giant Navy dirigibles to be built by the Akron company. The Great Lakes organization will also make all dies required by the Goodyear-Zeppelin Corporation and will asemble some of the strips.

TWO WORKERS ARE KILLED IN GOODYEAR EXPLOSION

Two employes were killed when a boiler in the tube curing room of the Goodyear Tire & Rubber Company Plant One at Akon exploded on the morning of January 22 and demolished two stories of a six-story bridgeway between two departments of the factory. The dead workers are John H. Andrews, president of the Denison, O., city council and former city clerk and auditor of that city, and George Bender, an oiler, who had been employed by Goodyear for eight years.

The force of the explosion of the 12-foot tank completely blew out two brick walls, demolishing a six-inch concrete floor and twisting steel reinforcements. Workmen in the main buildings near the bridge were cut by flying glass and particles of stone and brick. The cause of the explosion was not determined by Goodyear engineers.

The tank was one from which hot water was forced into a water operated tube curing boiler, where truckloads of tubes on steel racks are vaulted for the process. Within a few weeks, a new system was to have replaced the old method of curing, according to officials of the company.

GIANT TIRE & RUBBER NAMES SALES MANAGERS

To provide closer contact with its dealers, according to President C. H. Hart, the Giant Tire & Rubber Company, Findlay, O., has added four divisional sales managerships to its existing sales organization. To fill the newly created positions, promotions have been made within the company and the new appointments have already taken effect.

The new divisional sales managers are C. N. Harrington, Leroy, Ill., northwestern division; R. O. Davis, Columbus, O., northeastern division; M. C. Vann, Fayetteville, N. C., southeastern division; and H. J. Eagle, Dayton, O., southwestern division. All four men have had long experience in their respective territories.

FIRESTONE FOOTWEAR CO. ISSUES NEW CATALOGUE

The Firestone Footwear Company, Boston, Mass., has just issued its 1928-29 catalogue on canvas footwear to the trade. The Thorogrip and Tiretred are featured among the company's basketball shoes in the catalogue, and the Commander and Camper are both listed as adapted to outdoor usage. For the out-of-door workman, Firestone offers the Workshoe.

Other shoes illustrated are the Yachting Oxford, Gymnasium, Outing Pal, and Outing Oxford. The Pilot is recommended as an outdoor shoe for good service.

AMERICAN CYANIMID CO. IN $4,000,000 EXPANSION

The American Cyanimid Company, New York City, has approved an expansion and improvement program at its different plants to cost more than $4,000,000, including buildings and equipment. The work will involve extensions in the works at Niagara Falls, N. Y., to increase the rated output by approximately $100,000 tons of cyanamide yearly, making a total capacity of 355,000 tons a year.

Additions to the Ammo-Phos Works, Warners, N. J., with added equipment will provide for an increase of about 48,000 tons annually. Other plans include the expansion of the plant at Linden, N. J., and the acquisition of phosphate property near Plant City, Fla. The company has arranged for an increase in capital stock to provide for the expansion.

ATTEMPT TO DISSOLVE WILLIAMS FOUNDRY CO.

Arguments by attorneys was heard last month in an attempt to have Common Pleas Judge E. H. Boylan grant a motion for the dissolution of the Williams Foundry & Machine Company, one of the oldest firms in Akron. It was alleged that the company has failed to pay dividends on preferred stock for about a year and that the losses of the company have been eating up the surplus.

Attorney William A. Kelly and Dudley Maxon, representing the company, pointed out that preferred stockholders would get 75 cents on the dollar in the case of a dissolution. One of the common stockholders, represented by Attorney Paul Weick, asked for a delay of a week in the case, which was granted by Judge Bolyan. At that time the court will consider appointing a receiver in case an order of dissolution is made.

F. Russell Boyer

F. Russell Boyer, for 16 years associated with the Goodyear Tire & Rubber Company, died at his home in Akron January 10 at the age of 48. Mr. Boyer was prominent in Masonic circles and in other organizations.

R. H. Pease

R. H. Pease, formerly an official of the Goodyear Tire & Rubber Company, died on the evening of January 25 at El Paso, Tex., from burns received when his automobile caught fire. Until a few weeks ago he was a resident of San Francisco.

HUETTER-PREMIER AGENTS ARE APPOINTED ABROAD

Appointments of representatives in the United States and in several foreign countries have just been made by the Huetter-Premier Machine Company, Detroit, Mich., for the distribution of the organization's various products. A very satisfactory business has been reported on the Huetter-Premier steam tube splicer, which was announced only a few months ago, orders having been received from both American and foreign tire and tube manufacturers. The company's metallic expansion core for curing tires, which replaces the present rubber airbag, has also aroused international interest.

The newly appointed agents include the following: Amtorg Trading Corporation, New York City; Lombard J. Smith Company, Los Angeles, Cal.; Ohio Rubber Engineering Company, Akron, O.; Augusto Cruz Eroles, Guatemala; Sociedad Chilena de Repuestos y Accessories, Antofagasta, Chile; Francis Shaw & Company, Ltd., Manchester, England; Mathias Mohr, Frankfort a/M, Germany; Alberto Peretti, Milan, Italy; and Guy, Chavant & Prevost, Paris, France.

YOUNG APPOINTED AGENT OF RUBBER LABORATORIES

John Young, who for the past two years has been engaged in the manufacture of asphalt, has returned to the rubber accelerator field and will act as eastern representative of the Rubber Service Laboratories Company, Akron, O. Mr. Young is well known in the rubber industry and has had a unique experience, having been first connected with a rubber plantation in South America and then later associated with the research laboratory of the Diamond Rubber Company in Akron, were, under Dr. D. Spence, the earliest work on rubber accelerators was carried out.

He afterward became chief chemist of the Firestone Tire & Rubber Company, leaving that position to work as manager of the intermediates division of the National Aniline & Chemical Company. It was while Mr. Young was with this company that the litigation in connection with DPG and the Bayer dissociation constant patent was successfully carried out, and his knowledge of the earliest work on accelerators proved extremely valuable.

INDIA'S 28-POINT RISE FEATURES STOCK TRADING

India Tire & Rubber was the feature of the fortnight in the trading among rubber company stock issues on the different exchanges. This stock, which had been selling at 39 early last month, jumped from 45½ on January 21 to a new peak of 73, later receding to 67⅛. The announcement that the company had finished the past year with a profit, although small, combined with the assertion that a Los Angeles plant may be built, contributed to the rise.

Gains were reported among other issues, and new high levels for the present year were made by Ajax, Falls, Faultless, Firestone preferred, Fisk common and preferred, Miller preferred, and Norwalk. Kelly Springfield and Seiberling showed tendencies to decline and made new lows for 1929.

Pirelli stock, the first foreign rubber issue to be introduced on the New York Stock Exchange, was offered at 60 but trading began at 65 and has continued at that level since.

Goodrich Sends Out "Silver Fleet"

CARRYING a good will message from Mayor Walker of New York to the Mayor of Los Angeles, 14 passenger cars and one large Mack truck are now on their way across the continent as a part of the tire testing activities of the B. F. Goodrich Company. The Goodrich organization has for years maintained tire testing fleets in different parts of the country, but this is its first attempt to dramatize this activity for publicity purposes. The "Silver Fleet," as it is termed started its tour heralded by full page advertisements in New York newspapers and will try to use every type of road possible to determine the ability of Goodrich tires to stand up under all conditions. No less than 35 other Goodrich products, such as fan belts, windshield wiper blades, radiator hose, floor board mats, and hard rubber steering wheels are also included in the equipment of the fleet.

Late Stock Prices

	Last Price		High	Low
	Feb. 4	Jan. 21	—1929—	
Ajax	10⅝	10¼	11¼	9½
Falls	8½	6	8½	5
Faultless	38	35	39½	33
Firestone	240	234¾	250	225½
do. 6% pfd.	111	110	111	109½
Fisk	17⅝	18⅛	20⅛	15⅝
do. 1st pfd.	78½	78	82½	68½
General	—	260	282	260
do. pfd.	101	102	102	99½
Goodrich	97	100¼	105¾	94⅛
do. pfd.	114⅜	115	115	113
Goodyear Com.	129¼	127¼	140¼	122½
do. pr. pfd.	102½	103½	103⅞	102
Hood	25	25⅝	26½	25
India	67⅛	45½	73	39
Intercontinental	11¼	12⅝	14¼	11
Kelly Springfield	21¼	22	24	20½
do. 1st pfd.	97⅞	99	100	97⅞
Lee	22½	23	25	21¾
Miller	24¾	24¾	28¾	22½
do. pfd.	82	81½	83	75
Mohawk	59½	61	66	59
do. pfd.	85	85	90½	81
Norwalk	6	5⅝	6¼	5
Seiberling	58⅜	58	65	56
do. pfd.	107½	106½	107⅞	105⅝
U. S. Rubber	50¼	51½	55¼	42
do. pfd.	87½	89	92½	81

Names in the News

HARRY T. DUNN, president of the Fisk Rubber Company, and FRANK K. ESPENHAIN, executive vice-president, acted as hosts to PRINCE CYRIL of Bulgaria when he visited Chicopee Falls, Mass., last month. The Prince complimented the Fisk officials on the smooth working organization they have built up.

HOMER C. CAMPBELL, assistant treasurer of the Firestone Tire & Rubber Company, was elected potentate of Tadmor Shrine at its annual session at the Akron Masonic Temple on January 12. Mr. Campbell has been affiliated with the Masonic order for 20 years and is a past president of the Masonic Club of Akron.

J. C. STONEBURNER and R. W. ROYER, of the Goodyear Tire & Rubber Company, received awards for meritorious service from the Goodyear Industrial Assembly on January 26, preceding the program for the regular "employes' night" at the Goodyear Theatre. The feature of the evening program was a talk by R. S. WILSON, vice-president and sales manager of the company.

WARD B. ALGOE has been appointed northwest district sales representative for the Thermoid Rubber Company, Trenton, N. J. Mr. Algoe was formerly connected with the Chanslor & Lyons Company of Seattle, Wash.

WILLIAM O'NEIL, president of the General Tire & Rubber Company, presided over a Pacific Coast dealers' conference held in San Francisco on January 21. He has been accompanied on his western trip by F. D. GABLE, experimental engineer, and BEN HEER, assistant sales manager.

A. S. WOLFORD, statistician of the Firestone Tire & Rubber Company, gave a talk before the Commerce Club of the University of Akron at its regular meeting last month. He declared that statistics play a vital part in purchasing materials for industries and stated that the prospects for 1928 prosperity continuing past the first half of 1929 were not promising, due to the shortage of credit.

R. L. HUNTER and N. A. NIGOSIAN, of the Goodyear Tire & Rubber Company, will leave shortly for Gadsden, Ala., to take up new positions at the new Goodyear plant there. Mr. Hunter, who began as a carpenter in the company 17 years ago, will be master mechanic, and Mr. Nigosian, who came direct to Goodyear from the University of Wisconsin 13 years ago, will have charge of electrical work.

C. W. WEYBURN, formerly service station superintendent for the Union Oil Company, and more recently sales representative for the Ajax Rubber Company, has joined the Samson Tire & Rubber Company as a salesman.

ARTHUR H. MASSEY, general sales manager of the Combination Rubber Company, Trenton, N. J., has been on a business trip, visiting the company's branches in the western states.

BRUCE BEDFORD, HORACE T. COOK, GENERAL C. EDWARD MURRAY, CHARLES E. STOKES, WILLIAM J. B. STOKES, CLIFFORD H. OAKLEY, and HORACE B. TOBIN, well known rubber men of Trenton, N. J., have been appointed members of a committee to raise funds for the Trenton Hospital for Crippled Children.

R. L. WETZEL, formerly assistant advertising and sales promotion manager of the Dayton Rubber Manufacturing Company, Dayton, O., will in the future devote his entire efforts to sales work, assisting D. W. WARDEN, vice-president in charge of tire

H. H. MILLER R. L. WETZEL

sales, and LYNN HARVEY, manager of tire sales. Mr. Wetzel has been with the Dayton organization since 1925. H. H. MILLER, who has been with Dayton since the early part of 1927 in the advertising department, will now assist E. B. SELF on the sales promotion and advertising work formerly handled by Mr. Wetzel.

C. E. BROWN, of the B. F. Goodrich Company, was elected vice-president of the Akron Purchasing Agents' Association at the annual meeting, January 14. R. D. BROWN, of the Miller Rubber Company, was named secretary, and W. M. MAPES, of the Seiberling Rubber Company, treasurer. J. A. PETTY, of the Akron Rubber Reclaiming Company, was chosen as a director of the organization.

JOSEPH ANDREOLI, export manager of the India Tire & Rubber Company, received Akron's first long distance telephone call from Vienna, Austria, on January 16, when he took an order for tires from the Frankel Company of that city. After the business call was completed, HENRY FRANKEL, who has been studying factory methods at the India plant for several months, talked with his father in Austria.

HARVEY S. FIRESTONE, president of the Firestone Tire & Rubber Company, was re-elected president of the Park Trust & Savings Bank at the annual meeting of the stockholders January 16.

P. W. LITCHFIELD, president of the Goodyear Tire & Rubber Company, spoke before members of the Kiwanis Club at their noon meeting on January 17.

HORACE B. TOBIN, president of the Woven Steel Hose & Rubber Company, Trenton, N. J., has been elected a director of the Trenton Banking Company at the recent meeting of the stockholders.

B. W. DELGASS, vice-president of the Amtorg Trading Corporation, was a recent visitor to the factory of the Firestone Tire & Rubber Company at Akron. Together with Mr. Delgass were V. A. POKROVSKY, of the Russion government trust of rubber industries, and I. KHALEPSKY, of the Russian rubber trust.

G. H. CALLEN of the export department of the India Tire & Rubber Company returned to Akron last month after a six-month trip through the important markets of South and Central America.

CONGRESSMAN C. A. EATON, of New Jersey was the principal speaker at the annual employes' "get-together" meeting of the B. F. Goodrich Company held January 19 at the Akron armory. E. C. STONER of the tire production division acted as master of ceremonies at the affair, which was attended by about 2,000 Goodrich men and was featured by music, boxing bouts and vaudeville entertainment.

V. R. JACOBS of the Goodyear-Zeppelin Corporation was the principal speaker at the 12th annual meeting of the Akron Traffic Club held at the Portage Hotel on the evening of January 15, talking on the subject of "Rigid Aircraft." HARRY CARROLL of the Goodyear Tire & Rubber Company is president of the organization.

C. E. STEEL, formerly manager of the Pittsburgh branch of the Firestone Tire & Rubber Company, has joined the Pennsylvania Rubber Company, Jeannette, Pa., as factory zone sales manager. He was Firestone manager for four years and has been active in sales work in western Pennsylvania since 1910.

JOHN DONALDSON has been elected a vice-president of the General Rubber Company and in that capacity has been assigned by L. D. TOMKINS, president, to conduct the operations of the company at New York City. A native of Scotland, Mr. Donaldson was first connected with the organization at the Liverpool offices of the General Rubber Company in 1907. He was appointed manager of the Singapore office in 1916, opened the Penang branch office later, and has had first hand experience at all the important points at which the company operates in the Far East.

Rubber News Around the World

THREE RUBBER COMPANIES TO MERGE IN AUSTRALIA

The Barnet Glass Rubber Company has joined in negotiations for a merger with the Perdriau Rubber Company and the Dunlop Rubber Company of Australia. If, as is expected, the negotiations succeed, the amalgamation of the three firms will form a powerful combination with a paid-up capital of £4,414,000 or about $21,360,000. The capital of the Dunlop organization is £2,471,000, that of Perdriau £1,206,000 and that of Barnet Glass £737,000.

It is understood that the main principles of the merger have been agreed to and that only details remain unsettled. Except for 500,000 ordinary shares in the Dunlop company, for which the English Dunlop Rubber Company paid a premium of five shillings, with the option of a further 500,000 at a premium of 10 shillings, practically the whole of the capital of the three companies is owned by Australians.

Perdriau's last profit was £105,000 and that of Barnet Glass £105,000. Dunlop showed a loss of £36,000 in its last report. The merger of Australian Dunlop with Perdriau, which took place last April, involved paid-up capital of £3,500,000 and a turnover of more than £5,000,000 a year. It was understood that a £6,000,000 holding company was being formed to acquire the shares of both companies, which would retain their identity. Dunlop of Australia was registered in Victoria in 1899, and the present Perdriau company in 1904, although the business dates back to 1881.

There has been considerable development in the Australian manufacture of rubber tires in recent years, the British Rapson Tyre Company having established a branch factory in Tasmania and the Goodyear Tire & Rubber Company having erected a plant at Sydney. As a result, imports of tires have been cut down more than 60 per cent.

DUNLOP HEAD ACTS AS HOST TO KING GEORGE

Craigwell House, Bognor, has been placed at King George's disposal during his recuperation by its owner, Sir Arthur Du Cros, Bart. Sir Arthur is well known in the rubber and auto worlds, and in his early days he was a leading racing cyclist.

He is president and a life director of the Dunlop Rubber Co., Ltd.; chairman of the Parent Trust & Finance Co., Ltd., and the Foundling Estates, Ltd., and a director of Beecham Estates & Pills, Ltd. He was a member of Parliament for Hastings from 1908 to 1918. From then until 1922, when he resigned, he sat for Clapham. He is 58 and received his baronetcy in 1916.

Rubber Institution Meetings

The meeting of the Birmingham and district section of the Institution of the Rubber Industry on February 14 will be featured by a talk on the subject of "Some Problems in Connection with Proofing" by A. B. Hatton, B.Sc., D. I. C., A. I. C. The February meeting of the Scottish section will hear a paper on "Varnishes for the Rubber Industry," to be read of W. G. Martin, F. I. C., F. I. R. I.

Swiss Bar Solid Tires

Last October a new law took effect in the Canton of Tessin, Switzerland, prohibiting the driving of solid-tired motor vehicles. Only motor cars with pneumatic tires can obtain 1929 license plates, but vehicles equipped with semi-elastic or similar types of tires may be used until January 1, 1931, if their owners pay an additional 25 per cent to the usual tax this year and an additional 40 per cent in 1930.

THREE LONDON COMPANIES FAIL IN RUBBER "SQUEEZE"

Three of London's old established firms in crude rubber have failed with heavy obligations as a result of sharp advances and frenzied trading in the commodity during the past month. The news of their failure was revealed on January 16 and it was feared that at least one other important London rubber house might also be involved, although no confirmation has as yet been obtained.

According to information reaching the trade, the liabilities of one of the London principals may reach the equivalent of $275,000 and that of the other two between $100,000 and $150,000 each. The embarrassment of at least one firm was known to the London trade when the market first engaged in its rapid upward advance in value, causing wild and excited trading in the commodity.

Nothing has come of reports to the effect that a New York dealer was also in difficulties. A source very close to the house suspected denied the report some time ago and stated that there is no reason to believe that any member of the New York trade would be involved in a severe shortage on commitments as a result of the rise.

PNEUMATIC TIRES POPULAR ON TRUCKS IN ENGLAND

Solid tires for heavy automotive vehicles will soon be almost extinct in the United Kingdom. A month's experience of the increased speed limit for heavy vehicles, provided they are fitted with pneumatic tires, has led British experts to the above conclusion. The regulations now allow a speed of 20 miles per hour instead of 12 miles.

"I venture to prophesy that in three or four years' time, except for a few special jobs, solid tires will have disappeared," said Mr. Bristow, of the Commercial Motor Users' Association, in a recent interview. "Just as the solid tire displaced the steel tire before the war, so will the pneumatic tire displace the solid tire."

A director of the Dunlop Rubber Company, interviewed at the same time, agreed that there had already been a greatly increased demand for pneumatics for use on heavy vehicles.

"Bust the Balloon" is New Danish Game

HUNDREDS of inflated rubber balloons are scattered over the race track in this novel game of "spreng ballongen" or "bust the balloon." The scene is Copenhagen, and the idea is to see which automobile driver can burst the greatest number of the toy balloons. The game requires several quick-eyed referees. No American sports promoters have as yet announced their intention of introducing this sport into the United States.

CATALPO
for
Footwear

Rubber Goods and Specialties

New Corduroy Tire

A new tire, to be known as the Corduroy Triple-A Balloon, has been announced by the Corduroy Tire Company of Michigan, Grand Rapids, Mich. According to the manufacturers, this new casing is sturdier,

heavier and larger than any others they have produced, yet not too large or too heavy to be used in place of standard tires when extra long mileage, safety and riding comfort are of first consideration. The new tire is being manufactured in all popular sizes and is said to be quiet running and especially adapted for fast driving. Officials of the company claim that the tire is of unusually graceful proportions, its profile presenting a masterly and attractive symmetry.

"Featherwate" Galosh

Among the new style offerings of the Hood Rubber Company, Watertown, Mass., is this Featherwate galosh, fast becoming popular among the low-cut types of such overshoes. It is smart in cut and but ten ounces in weight, although built strongly

for long life. The manufacturers are advertising them extensively and expect them to be among the leaders in their line of rubber footwear.

Rubberized Driving Rope

There has recently been placed on the British market a new rope suitable for short center drives for machine tools, textile machinery, etc. The rope has a number of important features. It is very flexible and, being endless, there is no difficulty with regard to fasteners. It is made in tension and under enormous pressure and has practically no stretch, while it is true in its V form throughout its entire length. The rope is constructed of a number of straight textile strands spun from the best cotton yarn and impregnated under pressure and in tension with a special composition having Para rubber as a base. The core thus formed is bound with layers of fine cotton duck. As the V form is obtained throughout the entire length of the rope it is claimed that a positive non-slipping grip is exerted on the sides of the V pulley wheels at all speeds. The rope eases gradually and without permanent stretch, so that when the load is started up a smooth even start is assured. This is particularly important for precision tools and also for textile drives, where jerky starting results in many broken ends.

Protective Respirator

Designed for the use of manufacturers who employ chrome plating processes in their plants, these Cesco respirators are be-

ing offered by the Chicago Eye Shield Company, 300 Warren Avenue, Chicago, Ill. It is the purpose of these respirators to protect the nose, mouth, throat and lungs from the inhaling of dust and noxious fumes. The body of the respirator is made of aluminum, to which is fastened a soft moulded rubber cushion. This cushion fits the contour of the face to make the mask comfortable.

Colored Electric Wire

A complete line of colored wires and cables was announced by the United States Rubber Company on February 1 and is considered by the company as a step forward in the rubber covered wire industry. The Rainbow line of "U. S." Paracore wire, as it is to be known, consists of eight distinctively colored wires, making it easy for circuits to be followed.

Brake Lining in Rolls

The Manhattan Rubber Manufacturing Company, Passaic, N. J., has introduced a new feature in moulded brake linings by offering its Hycoe moulded lining in rolls, thus presenting a great stock-reducing ad-

vantage for the dealer. The high braking efficiency and long life of the lining is in no way affected by its flexibility, which is of a sufficient degree to permit easy conformity with any arc shoe. The same uniform co-efficient of friction and resistance to temperature and moisture which characterize Hycoe hydraulic compressed lining is said to be retained in the new moulded product. The linings are offered in widths of from one to six inches and in thicknesses ranging from one-eighth of an inch to three-eighths of an inch.

"Hi-Savoy" Galosh

Designed for slender ankles only, this new brown Hi-Savoy galosh is being marketed among the Ball-Band line of the Mishawaka Rubber & Woolen Manufacturing Company, Mishawaka, Ind. Pleasing in its chocolate color, it is approximately ten inches in height and is lined with tan net or tan fleece. Less than eight ounces in weight, it nevertheless has substantial soles

and durable heels and should give the wearer long use. The sole, upper and lining are elastic so that the different sizes can fit shoes a half size larger or smaller. It is made on two lasts, one with a 12/8 heel and medium narrow toe and the other with a 14/8 to 16/8 heel and a round toe.

Current Crude Rubber Items

RUBBER EXCHANGE PRICES RISE HIGHER IN TRADING

Although trading was not quite so active as during the previous fortnight, price levels rose to higher ground than has been attained since early last April. The peak day was reached on February 1, when spot quotations were at 22.50 cents a pound with the advanced positions ranging up to 23.80 cents for delivery in January, 1930.

The substantial bulge created by successive days of advances invited some realizing in the last two days of the period with a consequent reduction of about 70 points in most of the active deliveries. The announcement of tire price cuts by leading manufacturers also contributed in some measure to the decline. London cables are not especially conducive to liberal support on the buying side.

The most active trading session took place on January 24, when business close to record proportions was transacted with a total turnover of 2,717 contracts, or 6,792½ long tons. The second week of the period saw considerably less contracts made, although quotations advanced steadily with only minor recessions.

The table below indicates the daily fluctuations in prices on the Exchange and the daily volume of sales.

California Rubber Acreage Is To Be Increased Shortly

Officials of the American Rubber Producers, Inc., a subsidiary of the Intercontinental Rubber Company, who have already set out more than 200 acres for guayule rubber plants in the Santa Maria Valley of California, have announced that they will immediately increase this acreage by at least 100 per cent. Their first crop of matured rubber plants will be ready for the reduction process by 1930.

While the Intercontinental company is planting on a commercial scale in this section, its principal development is in the Salinas Valley of Monterey County, 150 miles farther north. The company also has commercial areas in Orange County and many experimental stations extending as far north as Red Bluff in Tehame County, which is approximately the same latitude as New York City.

The seat of John P. Sullivan on the Rubber Exchange of New York, Inc., was sold to John L. Handy on January 31 for $10,500. This represents an increase of $500 over the previous sale price.

BRITISH COMPANY PLANS TO ABSORB OTHER FIRMS

The directors of the United Sua Betong Rubber Estates announce that in view of the conditions now ruling in the rubber market it is not unlikely that opportunities of absorbing existing concerns may present themselves. If this anticipation is realized, it is expected that in some instances at least the vendors will desire to accept the purchase consideration in shares.

To provide for such a possibility, the directors propose to increase the company's authroized capital to £750,000 ($3,750,000) by creating an additional 250,000 shares of £1 each. The whole of the present authorized capital has been issued.

Rubber Exchange Dinner

Representatives of every branch of the rubber industry will attend the third annual dinner of the Rubber Exchange of New York, which will be held at the Hotel Roosevelt, New York City, on the evening of February 15. Fred B. Peterson is chairman of the dinner committee, and the other members are J. Chester Cuppia and James B. Bryan. According to officials of the exchange, the dinner will be, in effect, a celebration of the restoration of a free market for crude rubber in the United States, and it is regarded as the most important the exchange has ever held.

Closing Prices on Rubber Exchange of New York, Inc.

FROM JANUARY 22 TO FEBRUARY 4, 1929

		Spot	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Sales*
Jan.	22	20.50	20.40	20.60	20.80	21.00	21.20	21.30	21.40	21.40	21.50	21.60	21.70	——	675
	23	21.30	21.20	21.40	21.60	21.70	21.80	22.00	22.10	22.20	22.40	22.40	22.40	——	1,630
	24	22.40	22.30	22.30	22.50	22.70	22.80	22.90	23.10	23.30	23.50	23.50	23.50	——	2,717
	25	22.00	21.90	21.90	22.20	22.40	22.60	22.80	22.90	23.00	23.10	23.20	23.20	——	1,987
	26	22.20	22.00	22.20	22.30	22.50	22.60	22.80	22.90	23.00	23.10	23.20	23.40	——	490
	28	22.20	22.00	22.10	22.30	22.50	22.70	22.90	23.00	23.10	23.20	23.30	23.30	——	1,210
	29	21.70	21.50	21.60	21.80	22.00	22.20	22.40	22.50	22.50	22.60	22.70	22.70	——	1,323
	30	21.60	21.40	21.60	21.80	22.00	22.20	22.30	22.50	22.60	22.70	22.80	22.80	——	808
	31	22.20	22.00	22.10	22.40	22.50	22.70	22.90	23.00	23.10	23.20	23.30	23.30	——	1,060
Feb.	1	22.50	22.30	22.40	22.60	22.80	23.10	23.30	23.40	23.40	23.50	23.60	23.70	23.80	939
	2	21.90	21.70	21.80	22.00	22.40	22.60	22.70	22.80	22.90	23.00	23.10	23.20	23.20	384
	4	21.80	21.60	21.80	22.00	22.20	22.40	22.50	22.70	22.80	22.90	23.00	23.10	23.20	800

*In lots of 2½ tons each

CATALPO for Mechanicals

SCRAP RUBBER

We buy and sell all grades of Scrap Rubber
Let us have your inquiries
JOSEPH CHALFIN, Inc., 274 Madison Ave., New York, N. Y.
A. B. C., fourth, fifth and sixth editions. Lieber's and private codes used. Waste Merchants' standard code. Bentley's code.
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INTERNATIONAL PULP CO., 41 Park Row, New York, N. Y.
SOLE PRODUCERS OF PURE ASBESTINE SPECIALLY PREPARED FOR USE IN RUBBER
Covered and Protected by Letters Patent Registered at U. S. Patent Office, Washington, D. C.
LIBERAL WORKING SAMPLE FURNISHED FREE

Goodyear Workers Get Diplomas

Diplomas were awarded to 190 members of the flying squadron class of the Goodyear Tire & Rubber Company at a banquet in Goodyear Hall at Akron on January 12. The affair was attended by 1,600, including officers of the company, graduates and their families. Robert S. Cool, honor graduate, gave the class address, and L. D. Rockburg, was toastmaster, while F. O. Washam and Harry Shumaker were in charge of banquet arrangements. Addresses were made by P. W. Litchfield, president; C. C. Slusser, factory manager; R. S. Wilson, vice-president; and William Stephens, general superintendent.

Phelps Rubber To Be Auctioned

The entire plant and equipment of the Phelps Tire & Rubber Company, Garfield, N. J., now in the hands of receivers, will be sold at public auction on February 20, at 11:00 a. m. The sale will be made at the offices of the company, 142 Monroe street, Garfield. Details of the equipment offered and particulars regarding the property can be secured upon request from the receivers, Edward O'Byrne and William H. Dunn. Their address is also that of the plant.

Los Angeles Group Meeting

Members of the Los Angeles Group of the Rubber Division, American Chemical Society, held their fifth meeting at the Mary Louise, 2200 West 7th street, in that city, on the evening of January 31, preceded by a dinner. R. P. Dinsmore, chief chemist of the Goodyear Tire & Rubber Company, spoke on "Some Practical Aspects of Rubber Evaluation."

IT PAYS TO MICRONIZE

AN enormous molecular tenacity—the tremendous grip of each tiny particle—makes MICRONEX supreme for rubber footwear. It means the utmost in resiliency and long wear.

MICRONEX makes possible a lighter weight tennis shoe—a tougher sole and heel. The sun will not crack it, nor will water readily rot it. The jet black color makes black varnish superfluous.

For all stocks for tennis foxing, soling, moulded soles and heels, and fibre soles, insist upon

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The King of Rubber Pigments

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Crude - RUBBER - Scrap
41 East 42nd Street :: New York City

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BOSTON—176 Federal Street.
CHICAGO—327 So. LaSalle Street.
LOS ANGELES—728 So. Hill Street.
WAREHOUSES—JERSEY CITY, N. J., and AKRON, OHIO

RUBBER GOODS EXPORTS WERE HIGH DURING 1928

American exports of automobile casings during 1928 totaled 2,507,685 with a value of $31,064,635, while shipments of inner tubes amounted to 1,655,807, valued at $3,531,046. Exports of other casings and inner tubes numbered 62,153 with a value of $125,252, and solid tires for cars and trucks reached a total of 56,644, valued at $1,803,168. Shipments of other types of solid tires totaled 1,854,020 pounds, worth $400,247, and exports of tire sundries and repair materials during the year were figured at a total value of $1,635,495.

Domestic exports of rubber boots amounted to 1,263,237 pairs with a value of $2,816,934, while shipments of rubber shoes totaled 2,524,909 pairs valued at $2,758,393. The value of 5,313,375 pairs of canvas rubber-soled shoes exported was 3,674,723, and shipments of 1,468,635 dozen pairs of rubber soles and heels were figured at $1,910,647.

A total of 2,350,366 square yards of waterproofed auto cloth exported was valued at $1,290,672, while 1,774,462 square yards of rubberized piece goods and hospital sheeting reached an export value of $861,601. Waterproof outer garments shipped numbered 371,529, valued at $777,103.

Argentina continued to be the principal American market for tires and tubes, and the United Kingdom for rubber boots and shoes with Canada importing the greatest amount of rubberized auto cloth, piece goods and waterproof garments. The totals given do not include shipments made to Alaska, Hawaii and Porto Rico.

The Philadelphia Rubber Works Company

Manufacturer of

RECLAIMED RUBBER

of

STANDARDIZED QUALITY

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(Montgomery County)

CLASSIFIED ADVERTISING

10 cents a word, minimum charge $2.00, payable in advance.
Address replies to Box Numbers
THE RUBBER AGE
250 West 57th St., New York City

FOR SALE

Modern Plant with Complete Equipment to be sold at

PUBLIC AUCTION

On February 20, 1929, at 11 a. m.
at the offices of
PHELPS TIRE & RUBBER CO.
142 Monroe St., Garfield, N. J.
For details regarding property and equipment, address
EDWARD O'BYRNE AND WILLIAM H. DUNN,
Receivers for
PHELPS TIRE & RUBBER COMPANY,
Garfield, New Jersey

HELP WANTED

WANTED: A SALESMAN. Is there some live peppy fellow with compounding experience who thinks he isn't progressing fast enough and who wants to travel and sell compounding materials? Address Box 509, THE RUBBER AGE.

SITUATIONS WANTED

CHEMIST SALESMAN, long experience as compounding chemist, consultant and salesman, with wide acquaintance in trade, seeks connection in sales to rubber factories or branch office management, Akron district. Address Box 511, THE RUBBER AGE.

FACTORY EXECUTIVE AND CHEMIST, experienced in the rubber industry, who has built and managed a successful plant, personally controlling all phases of mechanical and development operations, desires to join a chemical or rubber factory where his technical knowledge plus executive ability can be utilized. Address Box 508, THE RUBBER AGE.

YOUNG MAN, 32 years of age, with 15 years' mechanical rubber experience, including all departments, capable of handling men, compounding all formulas and figuring stock costs, including gravity volume costs, would like to make a connection with small or large concern in any capacity. Address Box 510, THE RUBBER AGE.

BUSINESS OPPORTUNITY

A REAL OPPORTUNITY

Will lease large Georgia Clay deposit and milling equipment to responsible parties. Convenient to railroad and siding. Address Box 512, THE RUBBER AGE.

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The Hunter Process
in
The Carrier Ejector System Dryer

The successful drying of Rubber is essentially a problem of humidity control. The patented Hunter Process is used exclusively in Carrier Dryers. Carrier automatically controlled dryers reduce time, space and milling costs.

Write concerning your problem

Carrier Engineering Corporation
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AKRON-WILLIAMS A-W PRODUCTS

Heater Presses
Molds and Cores
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THE WILLIAMS FOUNDRY & MACHINE CO.
"In Business Since 1888"
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CUMAR
(Paracumarone Resin)

A Neutral Gum
For
Rubber Compounding

Clean and free from grit,
resists water, acid, alkali

Hard and Soft Grades

(Samples, price and descriptive literature will gladly be sent upon request.)

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Rand RUBBER GOODS

Dress Shields	Pure Rubber Sheets
Rubber Sheetings	Rubber Bibs
Bunny Baby Pants	Crib Sheets
Sanitary Requisites	Bathing Caps
Guimps & Brassieres	Rubber Specialties
Randprint Aprons	Powder Puff Pockets
All Styles Rubber Aprons	Randprint Rubber

SHEET GUM cut to pattern for manufacturers

"They Last Longer"

Made by
RAND RUBBER COMPANY, Inc.
Formerly Brooklyn Shield & Rubber Co., BROOKLYN, N. Y.

EMBOSSING CALENDERS

For Artificial Leather, Oil Cloth,
Carriage and Automobile Covers

DRYING MACHINES

with Copper or tinned iron Cylinders for Cotton Ducks, Drills and Sheetings

The Textile-Finishing Machinery Co.
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Perfect Beads

Entire freedom from bead trouble in the construction of straight side tires is assured by the use of either National "(Patent)" High Tensile Strength, Flat Woven, Bead Braid on our new (Pratt Patent) Bead Cables. These cables, made to dimensions specified, have seven strands, yet only one piece of wire is used without soldered, welded or brazed joint.

Write for working samples of either National flat braid or Pratt cables (no charge to tire manufacturers) and full information as to our products and service.

Our engineering department tests beads and furnishes complete confidential reports as to their stretch, set and bursting point, without charge. Inquiries solicited regarding this special service.

National Standard Company
Niles, Michigan

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ESTABLISHED 1890

Standard for 39 years

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CHEMICALS

Whittaker, Clark & Daniels, Inc.
IMPORTERS—MANUFACTURERS—EXPORTERS
245 FRONT ST. NEW YORK CITY

LATE MARKET PRICES

Crude, Scrap & Reclaimed Rubber - Cottons and Fabrics

NEW YORK, FEBRUARY 4, 1929

COTTON

FOR the month of January the average spot price of middling upland cotton was 20.22 cents, exactly the same as for December and almost a cent above the average of 19.28 cents a pound for January, 1928. The market has shown a tendency to decline, being unfavorably influenced during the fortnight by stale long liquidation promoted by the reluctance of spinners to fix prices of the large amount of cotton bought by them "on call." Other factors affecting the situation were the disappointing expansion in the domestic goods demand following the turn of the year and a falling off in southern spot market activity.

Predictions that the domestic production of motor vehicles this year will reach a total of 5,000,000 units are viewed with interest by factors in the cotton market inasmuch as authoritative estimates put the amount of cotton to be used in each car at about 32 pounds. These figures alone point to a consumption of 335,000 bales during 1929.

Current high, low and closing prices are as follows:

	High	Low Feb. 4	Close	Close Jan. 22
February	——	——	19.46	——
March	19.75	19.59	19.61	20.15
May	19.81	19.65	19.66	20.15

Tire Fabrics

The market on tire fabric during the past two weeks found a number of inquiries received and part of them translated into orders. None of the commitments were large since they were described as of filling in size. Mills were comfortably taken care of o the end of the first quarter but were able to book additional business. Late prices, which are somewhat lower than those of tivity quiet. Late prices follow:

CORD				
Peeler, carded, 22/5/3	lb.	.47	@	.48
Peeler, carded, 22/4/3	lb.	.48	@	.49
Peeler, carded, 12/3/3	lb.	.44	@	.45
Peeler, carded, 15/3/3	lb.	.44½	@	.45½
Egyptian, carded, 22/5/3	lb.	.54	@	.55
Egyptian, combed, 22/5/3	lb.	.58	@	.59
CHAFERS				
Carded, American, 8 oz.	lb.	.40	@	.41
Carded, American, 10 oz.	lb.	.41	@	.42
Carded, American, 12 oz.	lb.	.41½	@	.42½
Carded, American, 14 oz.	lb.	.40	@	.45
LENO BREAKER				
Carded American, 8¼ oz.	lb.	.40	@	.45
Carded American, 10¼ oz.	lb.	.40	@	.45
SQUARE WOVEN				
Carded American, 17¼ oz. 22-11 ply	lb.	.47	@	.48
Carded American, 17¼ oz. 10-ply	lb.	.40	@	.41

Sheetings

Price continued fairly firm with one or two slight declines in the sheeting market, but interest was lacking and selling activity quiet. Late prices follow:

40-inch, 2.50-yard	yd.	.12¾	@	.12⅞
40-inch, 2.85-yard	yd.	.11⅛	@	.11¼
40-inch, 3.15-yard	yd.		@	.12
40-inch, 3.60-yard	yd.		@	.09¾
40-inch, 3.75-yard	yd.	.08½	@	.08¾
40-inch, 4.25-yard	yd.		@	.07½

Ducks

Sales of cotton duck have been more active with almost the entire list of constructions included among transactions made The average order was said to be small, though the frequency found primary factors disposed to report buyers satisfactorily interested. Single filling, double filling, enameling and numbered ducks were among those sold. Late prices follow:

Belting and Hose	lb.		@	.37½
Enameling	lb.	.36	@	.38
Single filling	lb.	.14¾	@	.17½
Double filling	lb.	.17½	@	.18½

RECLAIMED RUBBER

Increased production volume in tire factories during 1929 is expected to have its effect on the consumption of reclaimed rubber and should bring the year's consumption to approximately 185,000 tons. Increased plant facilities can easily take care of this increase. The continued advance in crude rubber prices has had no effect on the reclaimed market, prices remaining stable. Orders have been maintained at a high level and are expected to show appreciable gains in the near future as manufacturers step up their output for the spring and summer months. Latest prices follow:

High Tensile				
Super-Reclaim No. 1 Black	lb.	.12	@	.12½
Super-Reclaim No. 2 Black	lb.	.11	@	.11¼
High Tensile Red	lb.	.12½	@	.13
Shoe				
Unwashed	lb.	.07¼	@	.07½
Washed	lb.	.10	@	.10¼
Tube				
No. 1 (Floating)	lb.	.13½	@	.14
No. 2 (compounded)	lb.	.10½	@	.11
Tires				
Black, washed		.09½	@	.10
Black, unwashed		.07½	@	.07⅝
Black selected tires	lb.	.08	@	.08½
Dark Gray	lb.	.09½	@	.09¾
Light Gray	lb.	.12	@	.12½
White	lb.	.13	@	.13½
Truck, Heavy Gravity	lb.	.07	@	.07¼
Truck, Light Gravity	lb.	.07½	@	.07¾
Miscellaneous				
Mechanical Blends	lb.	.06¾	@	.07½
Red	lb.	.12	@	.13

Scrap Rubber

Activity in the scrap rubber market has remained practically the same as during the past few weeks, and no marked change in prices have been recorded during the fortnight. Demand from reclaiming factories is expected to begin to increase as preparations are made for the spring and summer seasons of high tire production volume.

(Prices to Consumer)

Auto tire peelings	ton	$39.00	@	42.50
Standard White auto	ton	47.50	@	50.00
Mixed auto	ton	24.50	@	25.00
Bicycle tires	ton	20.00	@	22.50
Clean solid truck tires	ton	22.00	@	24.00
Boots and shoes	cwt.	1.40	@	1.55
Arctics, untrimmed	lb.	.00¾	@	.00⅞
Inner tubes, No. 1	lb.	.06½	@	.06¾
Inner tubes, No. 2, compounded	cwt.	4.25	@	4.30
Inner Tubes, Red	lb.	.05¼	@	.05⅜
Air Brake Hose	ton	34.00	@	35.00
Rubber Hose	ton	17.50	@	20.00

CRUDE RUBBER

UNUSUALLY bullish enthusiasm in the crude rubber market last month brought the average price for that period up to 20.14 cents a pound, with latest quotations a cent and three-quarters higher. Late news of tire price cuts from 2½ to 10 per cent by Goodrich and Goodyear brought the market level down somewhat and proved a factor for bearish activity.

Malayan shipments for January were 52,546 tons as against 66,763 tons in December. The net exports, however, were 39,131 tons, or about 16,500 tons less than the December figures. It is interesting to note that the total exports to the United States and the United Kingdom were about 10,000 tons less than the gross total, and in December, about 15,000 tons went to other ports than the United States or United Kingdom.

Recognizing these factors, the New York market has been receiving strong support, and selling encounters quick interest on the part of buyers. Manufacturers, however, are doing little in the market for actuals. The impression still prevails that any important recession in value will disclose a broad factory interest on the buying side and a big business in actuals. Manufacturers at the close of the period paid 21¾ cents for February and 21⅞ cents for March arrival of standard ribs, prices which dealers refused to entertain later when the tone firmed up, although it was asserted that an excellent factory business was available at the lower prices.

Prices on the New York outside market on February 4 were as follows:

Plantations—			
Ribbed Smoked Sheets—			
Spot-Feb.	.21⅝	@	.21⅞
March	.22	@	.22⅛
Apr.-June	.22¼	@	.22½
July-Sept.	.22⅝	@	.22⅞
First Latex, crepe spot	.22¼	@	.22⅜
Amber Crepe, No. 2	.20⅝	@	.21
Amber Crepe, No. 3	.20½	@	.20⅝
Amber Crepe, No. 4	.16¼	@	.16½
Brown Crepe, Clean, thin	.20½	@	.20¾
Brown Crepe, specky	.20⅜	@	.20⅝
Liquid Latex, per gal.	1.00		
Paras—			
Up-river Fine	.23½	@	.24
Up-river Medium	Nominal		
Up-river Coarse	.14¾	@	.15
Acre Bolivian, fine	.22	@	.22¼
Caucho Ball, Upper	.14	@	.14¼
Islands, fine	Nominal		
Centrals—			
Central, scrap	.13½	@	.14
Esmeraldas	.13½	@	.14
Balata—			
Block, Colombia	Nominal		
Block, Cuidad	.50	@	—

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers			
Spot-Feb.	10¾	@	10⅞d
Mar.-June	11	@	11⅛d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers			
Spot		@	10½d

Charles T. Wilson Co., Inc.
44 Beaver Street New York

Importers of

CRUDE RUBBER

Members Rubber Exchange of New York, Inc.
Members Rubber Exchange Clearing House, Inc.

AKRON OFFICE: 507 Second National Building
Telephone Main 3799

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That Velvet Feel to Rubber

The STAMFORD RUBBER SUPPLY COMPANY
STAMFORD, CONN.

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"TIRE" BRAND
SUPERFINE
99½%

"TUBE" BRAND
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100%

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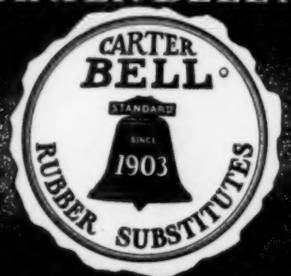
Air Floated — Pure White
UNITED CLAY MINES CORP.
TRENTON, N. J.
High Grade CLAYS of All Kinds

The CARTER BELL MFG CO



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"DURO" BRAND

GUAYULE RUBBER

Washed and dry, ready for compounding. Invaluable in conjunction with Plantation Rubbers and Reclaims as an aid in Compounding.
Especially useful in all Friction Stocks.

CONTINENTAL RUBBER CO., OF NEW YORK
1775 BROADWAY NEW YORK CITY

LATE RUBBER CHEMICAL PRICES

Accelerators—Colors—Softeners—Compounding Materials

NEW YORK, FEBRUARY 4, 1929

MANUFACTURERS of rubber chemicals and compounding ingredients are making every effort to be adequately prepared for the increased demand that is expected with the seasonal activity in tire manufacturing scheduled to begin next month. Present interest on the part of manufacturers continues unabated, and prices are being maintained by chemical suppliers without change. Albasan, the recently announced anti-oxidant, is selling from 70 to 75 cents a pound, and there are reports of a new liquid accelerator to be placed on the market shortly. Except for a half-cent rise among the carbon blacks, there was no change in price in the compounding material list.

Many producers of rubber chemicals have their plant production booked for weeks and, in some cases, months ahead. For this reason 1929 will see many expansions of factory facilities in order to keep pace with the rapid strides being made by the rubber manufacturing industry.

ACCELERATORS

Organic			
A-7	lb.	.55 @	.59
A-11	lb.	.62 @	.66
A-16	lb.	.57 @	.61
A-19	lb.	.58 @	.62
A-20	lb.	.64 @	.68
Aero-X	lb.	.75 @	—
Aldehyde ammonia, crystals	lb.	.65 @	.70
Aniline oil, drums, f.o.b. works	lb.	.15 @	.16¾
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolylguanidine	lb.	.42 @	.52
Diphenylguanidine	lb.	.30 @	.36
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde Aniline	lb.	.34 @	.44
Grasselerator 102	lb.	.62½@	.63½
Grasselerator 552	lb.	— @	4.45
Grasselerator 808	lb.	.80 @	.85
Grasselerator 833	lb.	1.17 @	1.30
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.62½@	.65
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.35 @	.45
Monex	lb.	3.25 @	—
Oynone	lb.	.68 @	.80
Para-Nitrosodimethylaniline, f.o.b. works	lb.	.92 @	.96
Piperidine-Piperidyldithio-Carbamate	lb.	4.45 @	4.60
R & H 40	lb.	.40 @	.42½
R & H 50	lb.	.40 @	.42½
R & H 397	lb.	.75 @	.77½
Safex	lb.	1.20 @	1.25
Tensilac, No. 39	lb.	.50 @	.52½
Tensilac, No. 41	lb.	.50 @	.52½
Thermio F	lb.	.50 @	.55
Thiocarbanilide, drums	lb.	.26½@	.28½
Thionex	lb.		
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.62½
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Waxene	lb.	.30 @	.32
Z 88	lb.	.65 @	.69
Inorganic			
Lead, sublimed blue	lb.	.07¾@	—
Lead, white	lb.	.10½@	.12½
Litharge, domestic	lb.	.09 @	—
Magnesia, calcined, light	per 100 lb.	5.25 @	5.45
heavy	per 100 lb.	3.65 @	3.75

COLORS

Blacks (See Compounding Materials)			
Blues			
Prussian	lb.	.32 @	.35
Ultramarine	lb.	.06 @	.30
Browns			
Sienna, Italian	lb.	.05½@	.12½
Umber, Turkey	lb.	.04½@	.07
Greens			
Chrome, light	lb.	.27 @	.31
medium	lb.	.29 @	.32
dark	lb.	.31 @	.34
Chromium Oxide, bbl.	lb.	.34 @	.36
Reds			
Antimony crimson, 15/17	lb.	.44 @	.50
sulphur free	lb.	.50 @	.55
golden 15/17 F.S.	lb.	.20 @	.25
Indian English	lb.	.08 @	.12
Domestic (Maroon)	lb.	.08 @	.12
Oximony	lb.	.13¼@	—
Red oxide, pure	lb.	.10 @	.12
Venetian red	lb.	.03 @	.06
Vermillion, quicksilver, English	lb.	1.85 @	1.95
Whites			
Lithopone, Akcolith	lb.	.05 3/5@	.06
Lithopone, Azolith	lb.	.05¾@	.05¾
Lithopone, Vanolith	lb.	.05¾@	—
Titanox	lb.	.09½@	.10
Cal. Base Pigment	lb.	.10 @	.10½
Zinc Oxide—American Process			
American Azo: ZZZ (lead free)	lb.	.06½@	.07
ZZ (leaded)	lb.	.06⅝@	.06⅞
Zinc Oxide—French Process			
White seal	lb.	.11⅞@	—
Green seal	lb.	.10⅞@	—
Red Seal		.09⅞@	—
Yellows			
Chrome	lb.	.15½@	.16½
Ocher, French medium	lb.	.03½@	.06
domestic	lb.	.01½@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate	lb.	.10½@	.12
Asbestine	ton	14.75 @	18.00
Barium carbonate	lb.	.03½@	.05
Barium Dust	lb.	.05 @	.06
Barytes southern off-color,	ton	12.00 @	13.00
Western prime white	ton	23.00 @	—
imported	ton	27.00 @	36.00
Basofor	lb.	.04½@	—
Blacks			
Arrow "Aerfloted"	lb.	.08½@	.12½
Bone Black	lb.	.05½@	.11
Carbon, compressed	lb.	.08½@	.12½
Carbon, uncompressed	lb.	.08 @	.12
Drop Black	lb.	.06 @	.10
Fumonex	lb.	.06 @	.09
Gastex	lb.	.05½@	.05½
Lamp Black	lb.	.12 @	.40
Micronex	lb.	.09 @	.13
Velvetex carbon	lb.	.04½@	.06
Blanc fixe dry f.o.b. works	lb.	.03½@	.03⅝
Carrara filler	lb.	.01¾@	.02
Catalpo (fact.)	lb.	.02 @	—
Chalk	ton	12.00 @	14.00
Clay, China, domestic	ton	8.00 @	9.00
Aerfloted Suprex	ton	10.00 @	22.00
Congaree, c. l. f.o.b. mine	ton	9.00 @	—
Mineral Flour, c. l. fob mine	ton	20.00 @	23.00
Tensulite		15.00 @	—
Glues, extra white	lb.	.22 @	.26
medium white	lb.	.20 @	.24
Magnesia, carbonate	lb.	.08¾@	.11
Mica, powdered	ton	65.00 @	80.00
Rotten Stone (powdered)	lb.	.02½@	.04½
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	3.30 @	3.70
Talc, domestic	ton	12.00 @	15.00
Whiting, commercial	cwt.	.85 @	1.00
English cliffstone	cwt.	1.50 @	—
Superfine	ton	10.00 @	12.00
Witco	ton	12.00 @	—
Wood pulp XXX	ton	45.00 @	—
Wood pulp X	ton	25.00 @	—
Zinc Carbonate	lb.	.09½@	.10½
Zinc Stearate	lb.	.24 @	.25

MINERAL RUBBER

Genasco (factory)	ton	50.00 @	52.00
Montezuma, solid	ton	28.00 @	36.00
Montezuma, granulated	ton	32.00 @	42.00
Paradura	ton	62.50 @	65.00
Pioneer, MR, solid	ton	42.00 @	45.00
Pioneer-granulated	ton	52.00 @	55.00
R & H Hydro-Carbon	ton	27.05 @	29.00
Robertson, MR, solid	ton	34.00 @	80.00
M.R. (gran)	ton	38.00 @	80.00

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulphuric, 60 degrees	ton	10.50 @	11.50
66 degrees	ton	15.00 @	16.00
Tartaric, crystals	lb.	.37 @	.38
Acids, Fatty			
Stearex	lb.	.15 @	.20
Stearic, double pressed	lb.	.18 @	.22
Alkalies			
Caustic soda, 76%	cwt.	3.76 @	3.91
Soda ash, 58% C.L.	cwt.	1.40 @	
Oils			
Corn, refined, bbls.	lb.	.11 @	.11½
Cottonseed, crude		.08½@	.08¾
Cycline	gal.	.27 @	.34
Degras (c.l. 100 bbls.)	lb.	.03¾@	—
Less c. l. (10-25 bbls.)	lb.	.04 @	—
Lots less than 10 bbls.	lb.	.04¼@	.04½
Fluxrite	lb.	.05 @	.06
Hexalin	lb.	.60 @	—
Acetate	lb.	.70 @	—
Linseed, Raw C.L. bbl.	lb.	.09½@	.10
Palm Lagos	lb.	.07¼@	.07½
Niger	lb.	.07¾@	.08
Vansulol	lb.	.10½@	.—
Para-Flux	gal.	.17 @	—
Peanut, domestic, crude	lb.	.12 @	.12½
Petrolatum, white	lb.	.08 @	.08½
dark amber	lb.	.03¾@	.03¾
Pine, steam distilled	gal.	.65 @	.70
Rapeseed, refined	gal.	1.04 @	1.06
second rectified	gal.	.58 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06½@	.07½
coal tar	gal.	.05½@	.06
pine, 200 lb. gr. wt.	bbl.	9.00 @	10.00
Rosin, grade K, 280 lb. bbl.		8.55 @	—
Pigmentar	gal.	.33 @	.41
Solvenol, drums	gal.	.48 @	.50
Tarol, drums	gal.	.30 @	.35
Tar Retort, 50 gal.	bbl.	12.50 @	13.00
Solvents			
Acetone, pure	lb.	.13 @	
Alcohol denatured, No. 1 bbls.	gal.	.37½@	.44½
Benzol, 90%	gal.	.28 @	—
Carbon bisulphide	lb.	.05½@	.06¼
Carbon tetrachloride	lb.	.06¼@	.07
Motor gasoline, steel bbls.	gal.	.17 @	—
Naptha, solvent	gal.	.35 @	.40
Turpentine, spirits	gal.	.60 @	.64
wood	gal.	.50 @	.54
Waxes			
Beeswax	lb.	.56 @	.58
Carnauba	lb.	.33 @	—
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.07 @	.07½
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Miscellaneous			
RSL Mold Solution	gal.	.75 @	.100

ANTI-OXIDANTS

Albasan	lb.	.70 @	.75
Antox	lb.	.79 @	.83
Neozone	lb.		
Oxynone	lb.	.68 @	.80
Resistox	lb.	.54 @	.57
Stabilite	lb.	.65 @	—
VGB	lb.	.55 @	.66

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb.	.10 @	.16
Brown	lb.	.08 @	.15

VULCANIZING INGREDIENTS

Sulphur Chloride (drums)	lb.	.03¼@	.03½
Sulphur flour, Refined, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags)	cwt.	1.75 @	2.10

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

INDICATIONS are that the final figures on crude rubber imports during January will establish a record for arrivals in this country and will materially change the position of American stocks, which for some time have totaled less than a two-month supply at the present rate of consumption. Estimates being made by authorities in the trade at from 51,200 tons to 60,000 tons, however, seem slightly high for January imports. Late estimates of arrivals at New York at 44,834 tons would hardly indicate that receipts at all ports will be much above 49,000 tons.

The bull campaign which featured the January rubber market had its effect in the monthly average price. This was 20.14 cents a pound, the highest figure since March of last year, and marked a gain of 2.17 cents over the average for December.

Although London stocks appeared to have reached the bottom of their V-point by the second week in December, reports for the week ending January 26 showed that they have started to decline again. The drop was only 876 tons, bringing the total down to 24,423 tons, but further decreases in coming weeks are not considered as wholly improbable.

December automobile production was just half that of August of last year, but it is expected that March will see the monthly output ranging well over the 400,000 mark again. Gasoline consumption in December was higher than the month previous and January and February should show only minor declines.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available. The section accordingly affords the most up-to-date, complete and convenient statistical service in the industry.

Table of Contents

United States Rubber Imports and Exports
Rubber Consumption in the United States
Rubber Invoiced to the United States
Daily Rubber Prices in New York
Monthly and Annual Rubber Prices
London Official Rubber Prices
Daily Cotton Prices in New York
Stocks of Crude Rubber in the U. S.
Stocks of Crude Rubber in London
Rubber in Singapore and Penang
United States Tire and Tube Statistics
Automobile Production—U. S. and Canada
Rims Inspected and Passed in the U. S.
United States Consumption of Gasoline
Rubber Exports from Producing Countries
Rubber Imports into Consuming Countries

U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1926:							
Jan.	42,404	72,528,151	76.36	2,059	3,747,505	81.24	40,345
Feb.	32,865	58,733,370	79.78	1,430	2,280,168	71.17	31,435
Mar.	42,152	70,589,581	74.76	1,836	2,735,234	66.51	40,316
Apr.	34,544	43,742,539	62.99	1,128	1,605,093	63.58	33,416
May	29,756	36,896,050	55.35	1,052	1,558,987	66.17	28,704
June	24,900	34,498,561	61.85	1,105	1,371,217	55.41	23,795
July	35,820	33,061,281	41.20	1,554	1,743,854	50.09	34,266
Aug.	27,400	24,670,752	40.21	1,318	1,339,563	45.38	26,082
Sept.	37,112	32,625,032	39.25	1,437	1,519,870	47.20	35,675
Oct.	29,746	25,320,558	38.49	1,366	1,316,270	43.03	28,110
Nov.	39,155	34,890,536	39.78	1,482	1,411,517	42.51	37,673
Dec.	37,754	33,261,366	39.33	1,904	1,841,305	43.16	35,850
1927:							
Jan.	43,340	36,753,719	37.86	1,525	1,444,734	42.28	41,815
Feb.	28,337	23,110,257	36.41	2,451	2,277,297	41.47	25,886
Mar.	35,515	28,693,016	36.07	2,763	3,249,665	52.50	32,752
Apr.	46,202	37,321,505	36.06	1,575	1,428,425	40.48	44,627
May	36,518	30,984,377	37.88	2,782	2,501,562	40.14	33,736
June	33,045	27,850,014	37.62	1,775	1,550,592	39.00	31,270
July	37,677	31,678,259	37.53	1,958	1,560,853	35.59	35,719
Aug.	32,810	26,396,931	35.92	1,809	1,382,768	34.12	31,001
Sept.	33,301	25,314,412	33.94	3,500	3,036,929	38.74	29,801
Oct.	30,184	22,163,282	32.78	2,513	2,042,713	36.29	27,671
Nov.	38,592	27,395,428	31.69	2,469	2,014,196	36.43	36,123
Dec.	30,737	22,213,574	32.26	2,655	2,245,754	37.77	28,082
1928:							
Jan.	39,107	30,278,444	34.56	1,988	1,734,990	38.95	37,119
Feb.	33,663	27,763,655	36.82	2,738	2,229,589	36.35	30,925
Mar.	40,611	32,103,042	35.29	3,718	2,587,435	31.07	36,893
Apr.	37,935	27,287,266	32.11	2,272	1,415,024	27.80	35,663
May	31,059	19,058,672	27.39	2,399	1,386,307	25.80	28,660
June	27,765	14,121,219	22.71	2,621	1,400,697	23.86	25,144
July	31,258	14,144,765	20.20	3,087	1,451,446	20.99	28,171
Aug.	31,204	12,860,150	18.39	2,377	1,084,646	20.37	28,827
Sept.	39,835	16,512,019	18.50	3,038	1,384,148	20.34	36,797
Oct.	44,058	18,200,332	18.44	2,405	1,085,407	20.15	41,653
Nov.	36,519	14,878,441	18.19	2,788	1,207,089	18.52	33,731
Dec.	43,511	17,580,966	18.04	2,738	1,165,743	19.00	40,773

U. S. Consumption of Crude Rubber

(Rubber Association of America statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1921	1922	1923	1924	1925	1926	1927	1928
Jan.	5,045	16,938	30,106	29,058	29,638	32,196	31,518	34,408
Feb.	5,955	14,767	30,149	25,736	29,761	31,136	30,137	33,702
Mar.	9,190	21,408	36,629	28,385	33,498	32,936	36,141	35,688
Apr.	13,084	19,294	29,085	27,129	34,139	32,696	35,871	32,772
May	16,023	23,246	36,155	25,845	35,322	29,364	34,592	37,333
June	16,142	31,713	24,272	22,753	35,822	28,598	33,801	37,676
July	18,310	24,522	17,685	23,396	36,053	27,577	29,219	37,497
Aug.	23,649	29,631	20,359	28,982	35,909	34,533	33,460	42,927
Sept.	16,705	24,410	17,594	31,497	31,691	32,904	27,214	39,882
Oct.	16,814	26,881	21,321	31,520	29,047	29,836	26,790	40,857
Nov.	14,105	24,950	20,457	27,289	28,853	28,080	26,792	37,461
Dec.	15,482	25,070	21,902	27,199	28,748	26,293	25,492	31,232
Totals	170,504	282,560	305,694	328,769	388,481	366,149	371,027	441,340

Figures on Quarterly Basis

Quarter	1921	1922	1923	1924	1925	1926	1927	1928
Jan./Mar.			96,776	87,609	95,263	94,301	99,216	103,558
Apr./June	65,463	127,360	89,493	75,674	104,099	87,109	103,242	103,500
July/Sept.			55,621	83,813	99,493	93,793	89,210	117,578
Oct./Dec.	105,962	155,067	63,617	92,656	85,789	83,212	80,860	
Totals	171,425	282,427	305,507	339,752	384,644	358,415	372,528	324,631

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Rubber Invoiced to the U. S.

(Reported by American Consuls—Quantities in Long Tons)

During the Week Ended	From Br. Malaya	From Ceylon	From Dutch East Indies	From London & Liverpool	Total
Nov. 3	6,097	1,121	3,402	1,130	11,750
Nov. 10	11,137	1,257	2,161	319	14,874
Nov. 17	11,171	1,557	1,573	533	14,834
Nov. 24	13,920	935	1,911	363	17,129
Dec. 1	10,731	1,265	2,624	963	15,583
Dec. 8	10,061	1,443	1,694	17	13,215
Dec. 15	9 785	1,661	2,215	330	13,991
Dec. 22	10,697	1,766	1,642	96	14,201
Dec. 29	8,613	577	2,197	8	11,395
Jan. 5	10,035	1,479	1,608	15	13,137
Jan. 12	9,075	1,628	1,807	299	12,809
Jan. 19	9,469	1,231	2,152	211	13,063
Jan. 26	7,163	1,650	2,271	47	11,131

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1926																																
July	42	42	42	42	—	41½	41½	41½	41½	42½	—	41½	41½	40	40	40	40	40	40	41½	41½	41	41½	41½	—	41½	41½	41	39¾	39	41¼
August	38½	38½	38½	—	87	39	39¼	38¾	40	87½	87½	87½	—	88	88½	88½	88½	88	89	89	89	89½	89½	89¼	42	89	89	41	39½	40	39½
September	40¼	40¼	40¼	43½	43¾	43¾	40¼	40¼	40	40¾	40¾	42½	42½	40¼	40¼	40¼	41¼	42½	42½	42½	41½	42½	42½	42½	42¼	42½	42½	42½	42½	42½	41	42½
October	43	43	43	41½	41½	41½	42½	41½	42½	42½	42½	42½	42½	42½	42½	43½	43½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	—	42½
November	41¼	41	41	87½	87½	87½	87½	87½	87½	87½	87½	41½	41½	87½	87½	40½	39½	39½	88½	88	88¼	88½	88½	88½	88½	88	87½	87	87	88½	—	85½
December	86¾	87½	87½	87½	87½	87	87	87	87	87	87	87½	87½	87½	87½	88	88	88	88	88	88¼	88½	88½	88	88½	88	89	89	88½	88½	88¼	88¾
1927																																
January	—	88½	89	89	89¼	89¾	—	—	—	40¾	40¾	40¾	40	39¾	39¾	—	39¾	38¾	89	88¾	88½	88¾	—	88	88¾	88¾	88¾	88¾	88	—	88	88¾
February	—	87½	87½	87½	87½	—	—	87½	87½	88	87½	87½	—	88	88¼	88	88¼	88¼	88½	88½	88½	88½	89	89	89	89	89	89	89	89	89	88¾
March	—	89¾	90	40¾	41	40¾	40¾	40¾	40¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41½	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾
April	—	41½	41¾	41¼	41¼	41¼	41¼	41¾	41¾	41¾	41¾	41¾	41¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40½	40½	40½	40½	40½	41	40½
May	—	41	41	41	41	41	41	41	41	41	41	41	41	40¾	40¾	40¾	40¾	40¾	40¾	40¾	41	41	41	41	41	41	40¾	40¾	40¾	—	—	40¾
June	—	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	87	87	35	84½	85	85	85	85	85	85	85	85	85	85	85	85	—	—	85
July	—	85½	85½	40¾	40¾	40¾	39¾	39¾	88¾	87¾	87¾	84¾	84¾	84¾	84¾	84¾	84¾	85	85	85	85	85	85	85	85	85	84¼	84¼	85	—	—	85
August	—	85¼	85¼	85¾	85¾	85½	85½	85¾	85¾	85¾	85¾	86	86	86	86	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	85½	84¼	84¼	84	84	84	85¼
Sept.	—	84	83¾	—	83¼	83½	83¾	83¾	83¾	83¾	83¾	83¾	83¾	84¼	84¼	84¼	84¼	84¼	84¼	84¼	84¼	84¼	84¼	84¼	84¼	84¼	84¼	84¼	84¼	85¼	85¼	84¾
Oct.	—	83¾	83¾	—	83¾	83¾	83¾	83¾	83¾	83¾	84¼	86¼	86¼	86¼	86¼	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
Nov.	—	85	85¼	85¾	85¾	85¾	85¾	85¾	—	86	86¼	86¼	86¼	86½	86½	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
Dec.	—	40½	40¾	40¾	40¾	40¾	—	—	40	40½	—	40	40½	40½	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
1928																																
January	—	87½	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾	87¾
February	—	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½
March	—	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½
April	—	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½
May	—	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½
June	—	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½
July	—	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½
August	—	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½
September	—	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½
October	—	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½
November	—	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½
December	—	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½
1929																																
January	—	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½
February	—	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½	87½

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.30
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Months	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25	20.14
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75	—
Mar.	14.53	34.21	22.83	41.00	59.00	41.04	26.82	—
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97	—
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99	—
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59	—
July	14.67	26.10	22.16	103.16	41.03	23.44	19.40	—
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46	—
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	18.47	—
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	18.83	—
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	18.26	—
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	17.97	—
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	22.48	—

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	Nov.	Dec.	Jan.	Feb.	Day	Nov.	Dec.	Jan.	Feb.
1	8⅞	8½	—	11⅛	17	8⅜	8½	10¼	—
2	8⅞	—	8⅝	11	18	—	8⅝	10⅛	—
3	8⅞	8½	8⅝		19	8½	8⅝	10⅛	—
4	—	8½	8⅝	—	20	8⅝	8⅝	—	—
5	8⅞	8½	8⅝	—	21	8⅝	8⅝	10⅛	—
6	8⅞	8½	—	—	22	8⅝	8⅝	10¼	—
7	8⅞	8⅝	8¾	—	23	8⅝	—	10⅜	—
8	8⅞	8½	8⅞	—	24	8⅝	8⅝	11	—
9	8¾	—	9⅛	—	25	—	—	10⅞	—
10	8¾	8½	9⅛	—	26	8⅝	8⅝	11	—
11	—	8½	9¼	—	27	8⅝	8⅝	—	—
12	8½	8½	10⅜	—	28	8½	8¾	11⅛	—
13	8¼	8½	—	—	29	8½	8¾	10⅝	—
14	8¼	8½	10¼	—	30	8½	—	10¾	—
15	8¼	8½	10	—	31	—	8⅝	11	—
16	8⅛	—	10⅛	—					

Average Monthly Price Per Pound

Month	1927 Pence	1928 Pence	1929 Pence	Month	1927 Pence	1928 Pence	1929 Pence
Jan.	19.410	19.310	9.942	Aug.	17.202	9.300	—
Feb.	19.021	15.713	—	Sept.	16.293	8.530	—
Mar.	20.125	12.736	—	Oct.	16.366	8.807	—
Apr.	19.897	8.864	—	Nov.	18.159	8.596	—
May	19.769	8.845	—	Dec.	19.690	8.570	—
June	17.880	9.293	—	Average for Year	18.375	10.656	—
July	16.770	9.312	—				

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Jan.	Feb.	Day of Month	Jan.	Feb.	Day of Month	Jan.	Feb.
1	—	20.05	11	20.25	—	21	20.40	—
2	20.10	20.05	12	20.35	—	22	20.40	—
3	20.25	—	13	—	—	23	20.40	—
4	20.00	—	14	20.55	—	24	20.30	—
5	20.00	—	15	20.25	—	25	20.10	—
6	—	—	16	20.55	—	26	20.10	—
7	19.95	—	17	20.35	—	27	—	—
8	20.00	—	18	20.40	—	28	20.15	—
9	20.25	—	19	20.40	—	29	20.05	—
10	20.20	—	20	—	—	30	19.95	—
						31	20.00	—

Average Monthly Price Per Pound

Month	1927 Cents	1928 Cents	1929 Cents	Month	1927 Cents	1928 Cents	1929 Cents
Jan.	13.42	19.12	20.22	Aug.	20.04	19.28	—
Feb.	14.10	18.40	—	Sept.	21.95	18.67	—
Mar.	14.32	19.38	—	Oct.	20.22	19.62	—
Apr.	14.75	20.63	—	Nov.	20.22	19.84	—
May	16.07	21.58	—	Dec.	19.58	20.22	—
June	16.85	21.50	—	Average for Year	17.49	19.97	—
July	18.00	21.36	—				

Stock of Crude Rubber in the U. S.

(All Quantities in Long Tons)

At	ON HAND			AFLOAT			ON HAND AND AFLOAT		
End of	1926	1927	1928	1926	1927	1928	1926	1927	1928
Jan.	55,198	76,172	110,244	46,296	45,312	41,256	100,434	121,484	151,500
Feb.	58,035	91,186	108,955	46,935	42,166	43,316	104,970	133,352	152,271
March	61,822	85,740	114,061	43,567	49,600	39,324	105,389	135,340	153,385
April	55,261	92,757	113,083	41,905	38,963	33,986	97,166	131,720	147,069
May	64,360	94,563	105,356	40,303	44,181	34,374	104,663	138,744	139,730
June	60,460	89,250	90,198	40,907	47,233	40,001	101,367	136,483	130,119
July	64,900	98,469	83,242	38,062	40,587	42,304	102,962	139,056	125,546
Aug.	60,870	96,148	68,994	37,360	40,937	51,875	98,230	137,085	120,869
Sept.	62,078	97,829	68,851	42,464	37,966	48,566	105,542	135,795	117,417
Oct.	64,089	97,452	66,421	52,930	42,804	41,571	117,919	140,256	107,992
Nov.	69,385	101,034	61,956	47,311	37,076	68,119	116,696	138,110	130,075
Dec.	72,520	100,130	66,166	52,020	47,938	68,764	124,540	148,068	134,930

(Rubber Association of America figures raised to 100%.)

Stock of Crude Rubber in London

(No. of tons in Wharves and Warehouses, including Latex)

At end of:	1920	1921	1922	1923	1924	1925	1926	1927	1928
Jan.	19,300	56,573	67,252	73,498	57,460	27,172	9,994	54,994	66,524
Feb.	18,329	59,439	67,623	70,483	56,732	23,425	10,004	58,826	62,964
Mar.	18,969	63,913	66,670	65,438	55,647	18,104	13,127	63,055	58,272
Apr.	20,072	68,759	68,637	58,770	54,559	12,949	18,773	66,897	53,425
May	20,921	70,403	70,146	54,439	51,615	5,895	20,384	67,169	44,628
June	22,517	69,408	71,597	51,050	51,115	5,318	23,984	63,902	38,756
July	25,346	71,065	71,515	49,937	52,073	4,258	27,727	63,717	35,429
Aug.	30,674	73,211	72,112	58,427	49,700	4,619	30,165	64,491	32,084
Sept.	35,504	72,175	70,977	54,523	44,011	5,453	35,077	68,236	31,440
Oct.	41,743	69,229	68,536	58,891	37,523	5,086	42,138	69,569	24,207
Nov.	45,550	70,786	68,548	60,074	33,593	3,869	44,057	67,050	17,775
Dec.	50,652	69,792	72,299	60,246	29,488	5,697	48,918	63,793	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1928					
January	64,360	65,524	65,450	66,285	———
February	65,909	64,945	63,769	63,103	———
March	61,978	61,920	61,033	59,644	58,197
April	58,732	58,945	56,819	53,360	———
May	52,015	50,337	48,705	44,628	———
June	43,716	42,683	41,185	40,083	38,611
July	36,915	35,925	35,238	35,445	———
August	34,294	33,649	32,591	32,815	———
September	31,933	31,477	32,110	31,884	31,462
October	29,525	27,370	26,477	24,240	———
November	22,919	21,494	20,194	18,724	———
December	16,855	16,517	17,669	18,821	19,727
1929					
January	21,953	23,016	23,547	24,423	———

Rubber in Singapore and Penang

(Stocks held by Dealers—Quantities in Long Tons)

End of	1926	1927	1928	End of	1926	1927	1928
Jan.	16,726	25,440	25,868	July	23,101	22,558	18,663
Feb.	13,653	26,766	22,867	Aug.	23,362	25,764	18,971
Mar.	18,389	27,844	20,538	Sept.	25,997	25,178	14,898
Apr.	16,328	24,543	16,946	Oct.	26,614	25,790	12,149
May	16,967	25,133	17,437	Nov.	25,486	28,369	29,188
June	19,416	21,898	18,207	Dec.	26,443	25,798	32,895

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1922	16,297,735	0.0	1925	26,001,664	66.8
1923	23,140,620	0.6	1926	24,199,524	78.8
1924	21,863,311	19.7	1927	19,700,003	79.1
1928			1928		
January	1,811,534	87.8	July	2,209,692	85.9
February	1,806,437	86.5	August	2,318,898	80.2
March	2,420,084	86.4	September	2,315,604	76.9
April	2,316,324	88.4	October	2,114,611	72.2
May	2,185,592	84.0	November	1,213,245	66.4
June	2,429,453	83.1	December	1,101,193	74.7

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1924	1925	1926	1927	1928
January	11,915,000	14,386,000	17,582,000	17,888,000	20,989,000
February	9,626,000	13,210,000	15,814,000	18,240,000	21,136,000
March	10,961,000	14,890,000	19,302,000	22,464,000	24,041,000
April	14,583,000	19,013,000	20,848,000	23,371,000	25,712,000
May	15,889,000	20,459,000	24,213,000	26,579,000	27,355,000
June	16,421,000	20,724,000	23,803,000	27,799,000	29,022,000
July	18,610,000	22,879,000	24,752,000	29,784,000	30,960,000
August	19,825,000	22,323,000	26,912,000	29,779,000	33,148,000
September	16,871,000	20,177,000	22,929,000	28,409,000	29,691,000
October	18,029,000	19,826,000	23,973,000	25,497,000	30,610,000
November	16,607,000	18,024,000	20,618,000	24,400,000	26,222,000
December	15,663,000	17,954,000	21,419,000	23,718,000	26,644,000
TOTAL	185,003,000	223,865,000	262,165,000	297,928,000	327,932,000

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926	1927
Production	40,932	45,259	51,633	60,845	61,237	64,439
Shipments	39,987	45,204	50,120	59,262	59,002	64,059
Inventory[2]	6,132	5,772	7,427	8,142	10,456	10,264

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1926	1927	1928	1926	1927	1928	1926	1927	1928
Jan.	4,587	4,965	5,491	2,974	4,932	5,394	9,947	10,432	9,949
Feb.	4,865	5,095	6,363	3,436	4,458	5,031	11,164	11,075	11,721
Mar.	5,456	6,276	6,819	4,561	5,701	5,731	12,004	11,583	12,389
Apr.	5,346	6,299	6,178	4,980	5,701	5,812	12,461	12,122	12,717
May	5,023	6,151	6,759	5,211	5,657	6,457	12,343	12,462	13,024
June	5,422	6,202	6,692	5,724	6,253	7,117	11,968	12,462	12,162
July	4,950	5,087	6,498	6,337	5,973	7,895	10,592	11,326	11,157
Aug.	5,872	5,752	7,469	6,744	6,393	8,403	9,732	10,721	10,034
Sept.	5,706	4,822	6,802	6,040	5,717	7,145	9,318	9,722	9,765
Oct.	5,103	4,773	7,326	4,544	4,799	5,717	9,917	9,665	11,520
Nov.	4,324	4,502	6,075	3,733	4,306	4,998	10,297	10,136	12,579
Dec.	4,683	4,497		4,718	4,165		10,456	10,264	

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926	1927
Production	50,850	60,116	70,706	82,614	76,618	70,823
Shipments	49,673	59,072	68,016	81,004	71,591	72,896
Inventory[2]	7,643	8,425	11,052	11,313	16,200	13,692

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1926	1927	1928	1926	1927	1928	1926	1927	1928
Jan.	6,809	5,337	5,441	3,723	6,016	6,072	14,361	15,585	12,982
Feb.	6,825	5,658	6,895	3,736	5,120	5,431	17,090	16,075	14,650
Mar.	7,030	7,184	6,231	4,987	6,157	5,731	19,131	17,096	15,573
Apr.	6,554	7,373	6,661	5,051	6,359	5,702	20,674	17,801	16,638
May	6,149	6,737	7,168	6,304	6,140	6,300	21,141	18,389	17,702
June	6,171	6,306	6,953	6,898	6,832	7,136	20,243	17,858	17,159
July	5,729	5,284	6,674	8,569	7,070	8,729	17,267	16,004	14,974
Aug.	7,424	6,480	8,343	9,579	7,983	9,350	15,462	14,664	13,931
Sept.	7,590	5,651	7,103	7,762	6,758	7,154	15,312	13,511	13,543
Oct.	6,208	5,065	6,929	5,474	5,024	5,662	15,929	13,539	15,285
Nov.	4,852	4,775	5,592	4,045	4,723	5,002	16,604	13,585	15,743
Dec.	5,277	4,969		5,463	4,712		16,200	13,692	

(1) Rubber Association of America figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	Grand Total
1922	2,547,208	2,302,923	244,285	102,053	94,904	7,149	2,649,261
1923	4,020,255	3,631,728	388,527	146,438	129,228	17,210	4,166,693
1924	3,600,918	3,203,049	397,869	135,246	117,765	17,481	3,736,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,092	164,483	40,609	4,503,891
1927							
Jan.	238,926	199,650	39,276	15,376	11,745	3,631	254,302
Feb.	304,758	264,171	40,587	18,655	14,826	3,829	323,413
March	394,430	345,911	48,519	23,250	19,723	3,527	417,680
April	404,743	357,009	47,734	24,611	20,890	3,721	429,354
May	404,099	357,148	46,951	25,708	21,991	3,717	429,807
June	321,959	278,728	43,231	19,208	16,470	2,738	341,167
July	268,474	236,866	31,608	10,987	8,719	2,268	279,461
Aug.	308,807	274,378	34,429	12,526	10,139	2,387	321,333
Sept.	260,420	226,440	33,980	11,262	8,681	2,581	271,682
Oct.	219,712	183,041	36,671	7,791	6,236	1,555	227,503
Nov.	134,381	109,742	24,639	6,617	5,173	1,444	140,998
Dec.	133,178	105,784	27,394	3,435	2,277	1,158	136,613
TOTAL	3,393,887	2,938,868	453,019	179,426	146,870	32,556	3,573,313
1928							
Jan.	225,039	199,032	26,007	8,463	6,705	1,758	233,502
Feb.	323,368	290,830	32,358	12,504	10,315	2,189	335,872
March	412,825	371,408	41,417	9,724	7,478	2,246	422,549
April	409,948	364,877	45,071	24,240	20,546	3,694	434,188
May	425,990	375,798	50,192	33,942	29,764	4,178	459,932
June	396,967	356,439	40,528	28,399	25,341	3,058	425,366
July	390,445	337,933	52,512	25,226	20,122	5,104	415,671
Aug.	458,429	400,689	57,740	31,245	24,274	6,971	489,674
Sept.	413,722	358,872	54,850	21,193	16,572	4,621	434,915
Oct.	397,096	339,976	57,120	18,536	13,016	5,520	415,632
Nov.	256,936	217,256	39,680	11,769	8,154	3,615	268,705
Dec.	233,135	205,144	27,991	9,425	6,734	2,691	242,560
TOTAL	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA[1]							DUTCH EAST INDIES[2]						
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[3]	India & Burma[4]	Sarawak[4]	British North Borneo[4]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[5]	Amazon Valley	All Other[6]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,955
1924	259,706	103,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	22,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,523
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,332	149,777	259,555	57,546	10,790	10,087	6,505	4,813	58,848	82,537	120,919	9,744	21,129	10,675*	653,148*
1927:															
Jan.	34,946	14,995	19,951	6,697	921	959	585	304	4,187	6,706	10,690	941	3,482	981	56,404
Feb.	27,528	11,697	15,831	3,571	1,469	552	445	360	4,078	6,526	10,535	675	2,104	1,098	47,244
Mar.	41,346	17,464	23,882	7,142	1,124	997	639	432	5,657	7,004	12,905	733	3,178	1,791	65,484
Apr.	29,041	13,069	15,972	3,349	723	984	452	526	4,666	5,531	10,197	557	2,451	1,520	46,928
May	31,393	15,491	15,902	3,124	760	786	415	348	5,430	5,529	13,410	586	2,460	1,207	49,957
June	32,607	14,706	17,901	3,348	856	1,100	539	409	4,818	5,518	9,109	772	889	1,731	46,990
July	23,947	12,697	11,250	4,018	827	859	544	333	4,771	6,142	11,566	519	1,757	1,113	43,699
Aug.	30,371	17,105	13,266	5,357	688	1,133	623	546	4,355	6,682	12,440	716	1,928	969	48,703
Sept.	29,835	12,095	17,740	4,911	479	645	566	498	3,635	5,957	9,853	497	2,072	1,213	48,066
Oct.	29,846	15,801	14,045	5,245	802	721	591	542	3,810	7,755	13,633	775	2,752	989	51,520
Nov.	28,277	19,860	8,417	4,464	1,277	1,241	591	600	4,127	6,587	14,395	683	2,369	1,627	46,378
Dec.	32,185	17,865	14,320	4,130	1,395	946	592	664	5,763	7,878	13,438	1,191	3,340	1,444	55,101
1928:															
Jan.	27,789	16,618	11,171	3,830	1,605	842	581	525	4,851	7,988	11,360	1,100	2,273	1,025	47,151
Feb.	28,848	12,911	15,937	4,947	1,081	667	581	536	4,052	6,757	8,635	787	1,612	1,276	46,868
Mar.	27,879	10,508	17,371	3,683	775	645	581	269	3,999	5,826	9,690	700	2,750	1,211	47,500
Apr.	20,129	9,335	10,804	3,233	789	630	494	258	3,993	5,040	5,538	786	1,014	1,328	33,852
May	26,483	10,350	16,133	3,091	654	842	494	241	4,943	5,355	10,382	717	2,602	1,135	46,049
June	22,994	16,168	6,826	3,107	963	926	494	451	5,419	5,863	13,623	725	1,399	960	40,756
July	30,481	13,383	17,098	5,129	1,043	905	593	366	5,602	7,566	11,424	698	1,264	873	52,561
Aug.	35,674	15,114	20,560	5,720	398	1,227	593	544	5,668	7,438	11,798	712	1,732	450	56,840
Sept.	29,769	11,239	18,530	4,675	457	938	594	447	4,956	6,536	9,791	1,112	1,614	494	50,144
Oct.	24,441	12,603	11,838	3,999	864	949	500*	457	5,295	7,474	9,977	566	1,399	732	44,050*
Nov.	68,072	10,436	57,636	8,005	1,048	772	500*	425	4,950	7,902	7,805	943	1,790	596*	92,372*
Dec.	66,763	11,112	55,651	8,127	1,113	744	500*	294	5,120	8,792	10,896	948	2,220	600*	95,005*

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, and 2,439 in 1927. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons in 1926, and about ½ ton in 1927. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I" are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, and 84 tons in 1927. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States*	United Kingdom	France (h)	Germany	Canada (ae)	Japan (da)	Italy	Russia (ee)	Australia (ed)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	236,977	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	342,378
1920	248,762	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	370,641
1921	179,678	42,087	16,135	21,920	8,124	21,713	3,906	165	1,614	1,705	1,022	1,279	2,245	569	300,562
1922	296,267	11,724	24,352	27,546	9,207	15,934	6,430	2,498	2,643	172	-5,807	1,778	589	567	395,885
1923	300,372	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	408,018
1924	317,747	-11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	-807	3,178	944	1,370	414,847
1925	381,815	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	516,498
1926	395,667	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	613,643
1927	398,483	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,492	636	4,224	2,055	2,672	627,789
1927:															
January	41,815	10,192	3,284	2,481	1,936	1,227	672	803	929	296	192	316	139	100	64,382
February	25,886	7,692	3,263	3,103	2,620	1,902	601	907	460	502	152	326	146	210	47,780
March	32,752	9,049	2,050	3,475	3,760	1,578	852	784	780	454	86	385	137	127	56,269
April	44,627	7,875	2,310	2,393	1,509	2,151	781	1,972	762	448	58	230	177	218	65,541
May	33,736	2,896	2,006	3,380	2,519	1,084	918	887	694	626	-57	335	155	223	49,402
June	31,270	2,282	2,387	3,632	2,086	798	942	1,506	557	583	-17	243	164	183	46,616
July	35,719	1,116	2,384	2,899	2,104	1,505	1,007	415	900	429	66	227	177	236	49,184
August	31,001	3,463	2,795	3,119	2,013	1,970	1,274	886	650	604	-63	312	138	123	47,785
September	29,801	7,800	1,956	2,891	1,850	2,025	684	518	772	552	-83	451	155	272	49,694
October	27,671	5,888	3,479	4,202	1,790	1,966	1,021	1,075	908	465	156	401	153	363	49,538
November	36,123	1,687	3,661	4,209	1,916	1,575	1,167	1,312	836	749	298	474	246	317	54,570
December	28,082	809	4,696	3,108	2,302	2,710	1,462	1,458	1,242	784	-202	514	268	300	47,028
1928:															
Jan.	37,119	1,921	1,764	3,485	2,290	1,361	760	755	802	589	52	261	335	376	50,870
Feb.	30,925	3,143	2,526	2,984	2,553	1,248	437	783	616	599	98	307	296	297	46,812
Mar.	36,893	3,179	1,902	3,521	2,989	1,694	763	231	918	816	95	351	497	398	54,254
April	35,663	—2,280	2,204	2,719	1,938	2,334	1,115	1,820	832	575	280	339	304	159	48,001
May	28,660	—5,823	3,210	2,944	2,180	2,288	1,095	3,893	655	746	209	485	220	213	41,469
June	25,144	—3,031	4,550	2,968	2,632	2,102	984	4,111	348	743	133	346	251	182	41,463
July	28,171	—1,374	2,652	3,387	2,692	2,026	1,599	724	591	895	395	294	175	384	42,609
Aug.	28,827	48	3,587	2,744	2,447	1,868	875	632	707	519	316	359	58	94	43,081
Sept.	36,797	4,199	3,524	3,553	2,810	1,837	1,278	20	603	597	345	377	277	235	56,452
Nov.	33,836	—3,141	3,278	3,694	2,799		1,049		776	696	141	527	250	318	
Dec.	40,781	8,438					1,340		837	544	31				

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. *United States imports of guayule are not included in this compilation; such imports amounted to 4,305 tons in 1926; to 5,019 tons in 1927; and to 3,076 in the first eleven months of 1928.

BOOK REVIEWS

CUTTING AND OTHER MACHINES. Published by the Black Rock Manufacturing Company, 177 Osborn Street, Bridgeport, Conn. 1929. 26 pp.

This is the first catalogue issued by this manufacturer and describes in detail an extensive line of washer and jar ring cutting machines, guillotine cutting machines, rubber stock cutting-off machines, double action stripping machines, automatic trimming and wrapping machines, packing calenders and brake lining calenders. Each item is illustrated and described at length, and the brochure reflects the company's 25 years of experience in manufacturing cutting machinery for the rubber industry.

RUBBER. Published by Henderson Rubber Reports, Inc., New York City. 1929.

Interest in rubber centers about its price, which is fundamentally determined by the relations of supply and demand. The intention of these reports, the first of which have just been issued, is to give concisely and accurately all important statistical and market information tending to influence crude rubber quotations. The reports, which will consist of weekly, monthly, quarterly and yearly reviews, tables and charts, are bound in an attractive loose leaf binder for ready reference and perpetual maintenance.

GENERAL INDUSTRIAL CLEANING. Published by E. F. Houghton & Company, Philadelphia, Pa. 1928. 36 pp.

Cleanliness has long been an axiom in every branch of the rubber industry, and it is the purpose of this little volume to describe in detail methods practicable for the removal of grease, oil and dirt from every imaginable surface under all kinds of operating conditions. Various industries are considered and their individual problems analyzed.

United States Imports of Guayule Rubber and Related Gums

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Gutta Percha	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,430	760,690	727	937,038	8,822	2,213,964	2,900	1,068,698
1920	758	345,985	1,064	1,260,048	5,672	2,068,501	3,183	1,520,309
1921	58	26,945	814	1,077,859	1,745	351,893	985	333,564
1922	127	57,040	812	978,765	2,335	403,812	818	281,012
1923	1,155	542,227	700	898,524	4,565	853,308	912	375,167
1924	1,356	536,392	464	568,456	6,165	1,237,100	1,408	463,610
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	1,603	629,284
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	1,445	661,156
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,494	728,172
1928:								
Jan.	432	242,339	27	24,213	588	183,705	150	86,702
Feb.	489	281,295	33	32,165	403	142,621	312	215,085
Mar.	575	365,927	32	26,460	829	388,616	115	57,833
Apr.	512	312,131	47	32,924	592	174,970	68	27,627
May	452	233,414	—	——	679	226,064	100	42,762
June	424	220,081	9	6,799	293	91,152	28	12,374
July	191	100,342	123	46,747	373	113,295	81	27,344
Aug.	—	——	399	165,460	451	126,962	147	60,738
Sept.	—	——	60	38,198	2,028	713,736	125	56,768
Oct.	—	——	121	59,358	429	129,065	239	94,570
Nov.	—	——	59	41,119	472	140,116	88	35,409
Dec.	—	——	83	58,311	522	156,154	145	59,911

Reclaimed Rubber in the United States

(All Quantities in Long Tons—100% Basis)

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1919	81,366	73,535	36.3	.....
1920	86,395	75,297	38.4	.....
1921	36,725	41,351	24.1	.....
1922	57,884	54,458	19.3	.....
1923	74,766	69,534	22.7	.....
1927:				
Jan.	16,526	12,374	39.3	25,903
Feb.	15,860	14,424	47.8	27,291
Mar.	16,788	13,528	37.4	27,124
Apr.	14,483	16,677	46.5	25,712
May	16,159	15,754	46.1	26,419
June	16,652	15,547	46.0	25,811
1928:				
Jan.	14,862	18,134	52.7	21,941
Feb.	15,291	16,808	49.9	20,848
Mar.	17,069	18,619	52.2	19,558
Apr.	15,393	17,355	52.9	19,283
May	18,945	18,201	48.8	18,137
June	18,781	16,328	43.4	18,7

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1924	80,079	76,072	22.4	.....
1925	132,930	137,105	35.6	13,208
1926	180,582	164,500	45.9	23,218
1927	189,144	178,471	47.6	24,980
July	15,488	13,842	47.4	26,599
Aug.	15,109	15,836	47.3	25,157
Sept.	14,392	14,790	54.3	23,429
Oct.	16,127	17,292	64.5	22,176
Nov.	15,477	14,876	55.5	21,728
Dec.	16,083	13,431	52.7	24,980
July	17,278	17,173	45.9	17,305
Aug.	19,049	15,532	36.2	15,881
Sept.	18,693	16,022	40.2	17,991
Oct.	17,182	16,587	41.7	17,026
Nov.	18,245	16,547	44.2	22,399
Dec.	17,728	12,894	41.3	24,785

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927.

INDEX TO ADVERTISERS

Adamson Machine Co. 519
Akron Equipment Co. 502, 519
Albert & Son, L. 476
Aluminum Flake Co. 504, 517
American Cyanamid Co. 518
Anderson-Prichard Oil Corp. 518
Appleton Rubber Co. 520

Barrett Co., The 513, 518
Binney & Smith Co. 511, 518
Bridgwater Machine Co. 519

Cabot, Inc., Godfrey L. ..... Back Cover, 517
Carrier Engineering Corp. 513, 519
Carter Bell Manufacturing Co., The 515, 518
Cincinnati Cutting Die Co. 519
Chaflin, Inc., Joseph 510, 520
Classified Advertising 512
Cleveland Liner & Mfg. Co. 520, 527
Colledge, E. W., Inc. 518
Continental Rubber Co. 515, 520
Cooper, Wm., & Nephews 517

Damascus Manufacturing Corp. 518
Dill Manufacturing Co. 520
Dovan Chemical Corp. 517
du Pont de Nemours & Co., E. I. 517

Emerson Apparatus Co. 519
Foote Bros. Gear & Machine Co. 479, 519
Farrel-Birmingham Co., Inc. 472, 519
Franz Foundry & Machine Co. 519

General Tire & Rubber Co. 519
Grasselli Chemical Co. 517
Greef, R. W., & Co. 504, 517
Gross, A., & Co. 518

Hall Co., The C. P. 471, 518
Harlomoor Co. 504, 520
Huber, J. M., Inc. 473, 518

International Pulp Co. 510, 517
Industrial Rubber Corp. 520

Lowe Co., The Clyde E. 475, 519

Maywald, Fredk. J. 520
McNulty, Joseph A. 518
Montgomery, W. L., & Co. 518
Moore & Munger 517
Muehlstein & Co., Inc., H. 511, 520

Nagle Machine Co. 519
National Aniline & Chemical Co. 478, 517
National Rubber Machinery Co. 519
National Standard Co. 513, 519
Naugatuck Chemical Co. 484, 517
New Jersey Zinc Co. 483, 518

Olin Laboratories, The R. R. 520

Pequanoc Rubber Co. 481, 520
Philadelphia Rubber Works Co. 512, 520

Rand Rubber Co. 513, 520
Rare Metal Products Co. 517
Roessler & Hasslacher Chemical Co. 517
Royle & Sons, John 478, 519
Rubber Regenerating Co. 470, 520
Rubber Service Laboratories Co., The 518

Schrader's Son, Inc., A. 520
Scott Co., Henry L. 519
Smith and Smith 520
Southwark Mfg. Co. 518
Spadone Machine Co. 519
Stamford Rubber Supply Co. 515, 518
Stauffer Chemical Co. 515, 519
St. Louis Sulphur and Chemical Co. 518
Surplus Trading Co. 519

Tasco Asphalt Co. 502, 518
Textile Finishing Machine Co., The 513, 519
Thomas, V. G., & Co. 517, 518
Turner, Halsey Co. 504, 520

United Clay Mines Corp. 515, 517
U. S. Rubber Co. 480, 520
U. S. Rubber Reclaiming Co. 474, 520

Vanderbilt, R. T., & Co. ..... Front Cover, 517

Weber, Hermann 520
Whittaker, Clark & Daniels, Inc. 513, 517
Williams Foundry & Machine Co., The 513, 519
Wilson Co., C. T. 515, 520
Wishnick-Tumpeer, Inc. 517

Institution of the Rubber Industry

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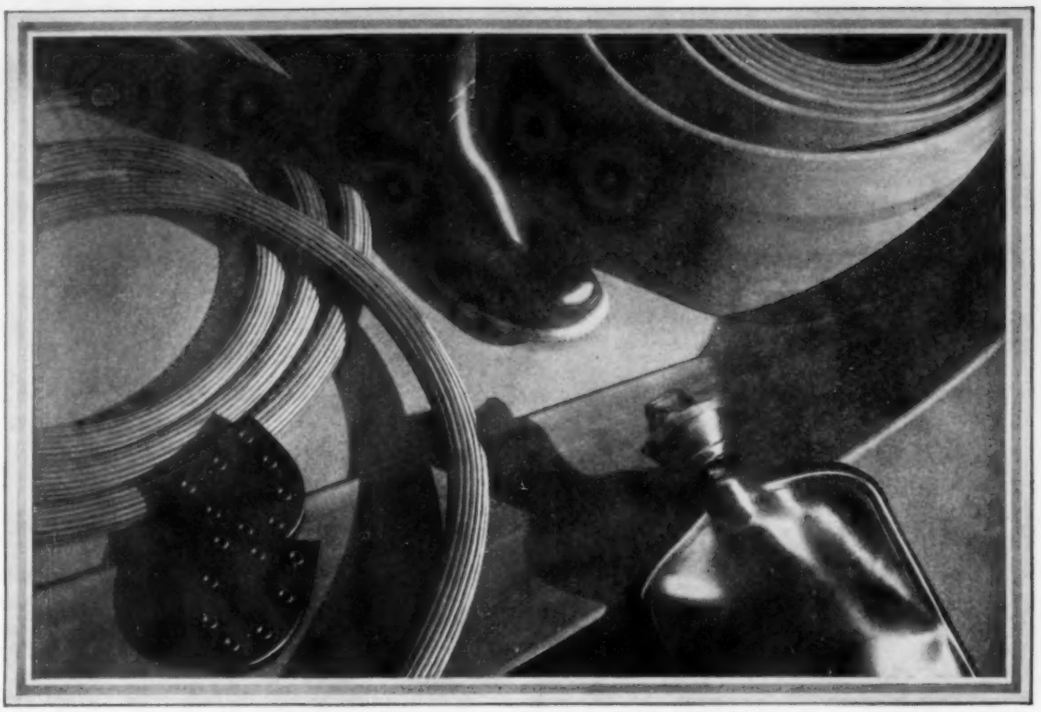

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